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JOURNAL

OF THE

TELEGRAPH.

A SEMI-MONTHLY RECORD OF THE PROGRESS OF THE TELEGRAPH,
AND OF ELECTRIC SCIENCE.

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JOURNAL OF THE TELEGRAPH.

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The Railwey Telegraph System.

HOW TRAINS ARE MOVED BY TELEGRAPH SIGNALS.

The importance of the telegraph in connection with railways was recognized many years ago ; but the first practical application of telegraphic signals in moving trains was made on the Erie line in 1850. Previous to that time locomotive engineers and conductors were distrustful, and there are several instances on record of their positive refusal to obey telegraphic orders, especially when their trains were directed to proceed beyond stations, to meet and pass trains in opposite directions, except in cases where such orders were plainly expressed in printed orders upon their regular time tables. In 1850, however, when the Erie road had but a single track between Piermont and Elmira, it was plainly demonstrated to the superintendent (the late Charles Minot) that the telegraph would be a very important assistance to the road, and it became plainly evident that the telegraphic service must be adopted upon all break lines.

When the first telegraphic message was sent over the Erie wires, a train filled with western-bound passengers was lying at Turner's Station, awaiting the arrival of an eastern-bound train, which, by the time-table, should meet and pass it at that point ; but owing to an accident two hundred miles west, it could not possibly arrive until five or six hours later. Mr. Minot was a passenger upon the train lying at Turner's. He immediately decided to test the accuracy of the telegraph, and make a begining of the plan of ordering trains to proceed to points further in advance, and not further delay the stationary train when the track was known to be clear as far as Port Jervis, a distance of one hundred and fifty miles further west. Orders were accordingly sent over the wire to the station agent at Port Jervis to hold all easterly bound trains until the arrival of the western train. This order was given in order to make all safe and prevent a collision in case the former should arrive at Port Jervis before the latter. An answer was immediately given by the station agent, announcing that he fully understood the order, and would do as directed. All appeared safe, and the engineer was ordered to start west ; but, to the astonishment of Mr. Minot, he positively refused to move the train from Turner's upon any such arrangement. Mr Minot immediately mounted the locomotive, pulled on the throttle valve and ran the train himself, assisted by the fireman, and reached Port Jervis according to programme.

The ice was broken, and since that time the telegraph has been acknowledged as a positive necessity on all long railroad lines in this country. As many as twenty trains have since moved in opposite directions at one time upon a single division of the Erie road with perfect safety. The form of giving the necessary directions, however, has been somewhat changed ; and now the conductors and engineers of each train who receive telegraphic directions, are telegraphed the name of the particular point at which they are to meet, and answers are required from them, to ascertain whether they understand orders, before any movement is made.

The following is the form of message required to be sent and received :

" By telegraph from——station to conductor and engineer : You will run to —— station regardless of train——, 31. ——Dispatches."

The numeral abbreviation means " How do you understand ?"

The answer to this dispatch must read as follows :

"22. (I understand I am to) run to —— station, regardless of train number ——

" ——Conductor "
" ——Engineer."

Upon receiving the announcement from the receiving operator that all is right the trains are started without further orders.

All special orders for the movements of trains are required to be communicated in writing, and extraordinary precautions are taken against the possibility of misunderstanding directions. Not more than one person on a division at the same time has power to issue train orders. The telegraph operator is required to read the messages aloud, in the hearing of the conductor and engineer addressed. Trains when in motion must approach stopping places in the supposition that another train is there to be met. Whenever a passenger train receives orders to meet and pass a freight train at a specific station, the conductor must not leave the depot until notice is received from the conductor that his train is safe upon the outside track, out of the way.

The foregoing rules are all the important instructions necessary to be observed in telegraphing trains on the Erie Railway, and similar rules are adopted upon all the lines throughout the United States. Many of these orders and forms were original with Colonel D. C. McCallum, formerly superintendent on the Erie road, and during the late war were in general use while he was military superintendent of all the railroads in the United Sates. Vast armies were moved under these rules with great success.

Some of the general regulations are remarkably perfect, and have been generally adopted. Each person in the employ of a railway company is required to devote himself exclusively to its service. Rudeness or incivility to passengers is in all cases to be met with immediate punishment, and all are directed to report any misconduct or negligence of others affecting the interests or safety of the road that may come to their knowledge. Persons witholding such information to the detriment of the company's interests, are themselves considered guilty of neglect or indifference. In all cases where instructions are not fully understood persons in the employ of the company are required to take the safe side, and make necessary explanations afterwards. A chronometer in the principal depot is the standard time of the road, and the time is telegraphed to all stations at precisely twelve o'clock each day.—*Evening Post.*

◆

William Cornell Jewett has obtained from the King of the Netherlands a concession to land and use on Holland soil an ocean cable from New York. Mr. Jewett intends laying the subject before the President.

Hon. Amos Kendall.

We deem it due to one into whose hands was committed the development of the American telegraph system by its illustrious inventor, to place in our columns one of the many similar testimonials which reach us from Washington of the high hold Mr. Kendall had secured on the public regard. With Mr. Kendall's political life we have nothing to do or say. The fires of that portion of his work have long since gone out. His later years were given to inaugurate a great invention and in most munificent charities.

ACTION OF THE DIRECTORS OF THE COLUMBIA INSTITUTE FOR THE DEAF AND DUMB, WASHINGTON, D. C.

At a special meeting held of the Board of Directors of the Columbia Institution for the Deaf and Dumb, on Tuesday, November 16, 1869, the following proceedings relative to the death of Hon. Amos Kendall took place, there being present, President Gallaudet, Rev. Dr. Sunderland, George W. Riggs, Esq., Hon. B. B. French, Henry D. Cook, Esq., James C. McGuire, Esq., and David A. Hall, Esq.

The President, in a few feeling remarks, made official anouncement of the death of Mr. Kendall, after which, Rev. Dr. Sunderland offered the following resolutions :

Whereas it has pleased Almighty God, in the unsearchable wisdom of His providence, to remove by death our late associate in this board, the Hon. Amos Kendall, at the advanced age of eighty-one years, and after a life of the highest usefulness and honor ; therefore,

Resolved, That in this event, we, the surviving members of this board, feeling the full weight of the affliction, both to ourselves and to the institution of which he was the founder and for several years the most powerful patron, do at the same time recognize in it the righteous hand of our Father in heaven, and bow in filial submission to the ordering of His sovereign will.

Resolved, That in the character and history of our departed friend the faculties that ennoble and the virtues that adorn our nature in all the relations, whether of public or private station, had a most conspicuous illustration. Endowed with an intellect of the largest grasp and of the clearest perception, he comprehended with equal facility the plainest and the deepest problems of human interest ; with whatever subject he was called to deal, whether in science or religion, in Church or State, in his hands its obscurities vanished, its difficulties disappeared. A man at once of the greatest simplicity, the greatest probity and the greatest resolution, he was equal to any task and fitted for any position of trust or honor that was in fact or that might have been assigned him among his fellow-countrymen. And in the succesive periods of his career we cannot fail to mark those rare qualities which most distinguish the man, the citizen, and the

Christian, and which, so signally combined in him, now furnish to the youth of our country an impressive and inspiring example.

Resolved, That, above all things, we acknowledge a deep and grateful sense of that Divine grace which, especially during the later years of his life, was shed upon him, and which gave to the close of his earthly existence the splendor of a cloudless sunset—the harbinger of human hope and the day-dawn of man's glorious immortality.

Hon. B. B. French, in seconding these resolutions, after referring to some interesting personal reminiscences, spoke as follows:

I came to Washington in December, 1833, and Mr. Kendall was one of the first persons with whom I became acquainted.

When the magnetic telegraph was in its swaddling clothes Mr. Kendall was associated with myself and a few others in nursing it into adult life. We were directors of the first company ever formed in the world, and we were both presidents of it at different times. We were co-laborers in bringing the great invention of Professor Morse from infancy to full manhood, and both of us had the extreme satisfaction of seeing our little line of two insignificant wires, extending from Washington to Philadelphia, grow into a huge network, covering nearly the whole earth, and spreading itself beneath the billows of the heaving ocean, bearing the whispers of man to man thousand of miles asunder.

This association led to a frequent intercourse between us. We met together, we travelled together, we occupied the same hotels together, and I enjoyed exceedingly the volumes of instruction and information which I derived from his ever active and well informed mind.

Again, in this board I met him; first as its president and then as a brother director, where you have all seen, and respected, aye loved him, while he poured out before you in his modest and unassuming manner sage counsels and wise advice.

Mr, Kendall, from his first entrance into business life, was a man of mark. Whatever he understood he prosecuted with all his might. He seldom, if ever, started into anything until he assured himself that it was right; but once in, there was no compromising, he pursued his object with a zeal and ability that assured success.

Honest in every action of his life, true to every principle he ever professed, patriotic to the last drop of his blood, with a courage, both physical and moral, that admitted of no retreat, he went forward, and did not, as such a man could not, escape the tongue of slander and reproach. But he lived it all down; he came out of the furnace the pure and refined gold of human nature, and in his latter days was acknowledged by all as one of the best of men.

He has gone from us in all the glory of an honest Christian man. "Joy, joy!" were the last words he uttered, and I doubt not that he now participates in that real "joy" which awaits all who live and die as he did.

◆

Female Operators in Germany.

According to the paper published at Debreczen, Germany, a Miss Hermine K., will subject herself to an examination as a telegraphist in the office of that place.

The management of the recently opened sub-station at Toeke-Kerebes has been entrusted to a Miss Emma Nagy.

The wife of Baron Metzger, Manager of the Telegraph Office at Tokay, sends the messages during the absence of her husband with as much facility as a schooled telegrapher.

The Mathematical Theory of Tensions.

Editor Journal of the Telegraph:

I desire to state that I have *not* "made a change of base, "nor have I "begged the question at issue," between myself and Mr. Prescott. I have simply undertaken to demonstrate that my "assumption" or "pretension," is not only in accordance with the views of every modern electrician, as far as I know without exception, but is in harmony with the known laws governing the action of the voltaic circuit. Mr. Prescott appears to consider De la Rive's work (written eighteen years ago) as the *only* standard authority on electrical matters, although it is possible that some progress has been made in electrical science by others since that time. Yet it may, perhaps, be worth while to examine De la Rive's work in order to further illuminate the subject.

On page 14 of Vol. I De la Rive says: "One of the electricities, the vitreous, has often been called *positive*, and the other, the resinous, *negative*; founding these two denominations upon this principle, that, like as by adding $+e$ to $-e$ we obtain 0, so, in giving to a body that is possessed of a certain quantity of resinous electricity, an equal quantity of vitreous, we have as a result the *zero* of electricity, a result which may be translated *mathematically*, only by giving the sign + to the quantity representing one of the electricities, and the sign − to an equal quantity representing the other. *This denomination is completely independent of the ideas that may be formed of the nature of electricity, for it rests, not upon a simple hypothesis, but upon experimental law.*"

It would be difficult to find anything more explicit than the above extract. What I have done in my last article is simply to translate this result mathematically, and in the only way it legitimately can be done, viz., by setting off a space corresponding to the + and − tensions respectively on each side of a neutral or zero line. And yet Mr. Prescott calls this "assuming the very point under discussion." The only assumption I have made is, that the two poles of a battery are in *opposite* electrical states. If Mr. Prescott will not admit this, it is a waste of time to argue the question further. On the contrary, if it be admitted, and I never knew it questioned before, the mathematical demonstration I have given cannot be overthrown.

What reason Mr. Prescott may have for stating that I am an advocate of the "Franklinian" or "one fluid" theory of electricity, as it is generally termed, is more than I can imagine. He says that the theory he is endeavoring to illustrate is based upon the "two fluid" theory of Symmer, and appears to think that as the former is untenable, the latter must necessarily be the correct one, a result which does not by any means follow. I have nowhere in the course of this discussion advocated, or even referred to, either the so-called "single" or "double fluid" hypothesis, for the simple reason, that both fail to acount in any manner whatever for some of the leading phenomena of electrical action, and, furthermore, that they are alike inconsistent with known facts of modern scientific research. Theories founded, in part, upon what is known to be untrue, can afford but little aid in the study of the principles of electricity.

It is scarcely necessary to remind the intelligent reader that my demonstration is founded, *not* upon the assumption that there is *more* or *less* electricity at one pole of a battery than at the other, but that they are in *opposite* electrical states, whether we consider it as *one* electricity separated into its two opposing principles, or as *two* electricities separated from each other.

Mr. Prescott says that Ohm has "never formalized nor speculated upon the subject under discussion," and that "the object of his law is to enable us to determine what the strength of the current will be unc. certain given conditions, and not to demonstrate how the current is created nor how it is propagated." This statement affords evidence that Mr. Prescott not only does not understand Ohm's "somewhat familiar laws," but that he has never seen them, or at least only one of them. Nearly one third of Ohm's original paper, occupying about eighty pages of closely printed matter, relates to the tensions of the voltaic circuit, in which the decreasing tension from each pole of the battery to the center of the connecting wire, or to use his own expression "the electric fall," is represented by a diagram upon the same principle as the one given by myself in my last article.

In regard to Mr. Prescott's diagram showing a wire connected from the center of a line to the earth, I would simply remark, that according to my views there should be *no* current in the wire, while according to Mr. Prescott there are *two*. The experiment gives no evidence of any current, the presumption is therefore in favor of there being none, and it rests with Mr. Prescott to prove that there are two.

When we come to critically examine Mr. Prescott's "*reductio ad absurdum*," it is apparent that it fails to settle the question as completely as he would have us think. He says that "a telegraph wire which depends upon a current due solely to a difference in tension, must be in bad condition for business when the tension is zero at both ends and in the middle." It will be remembered that I stated that "the current used in operating a telegraph wire is caused by the difference in tension between *the two poles of the battery employed*," *not* that it depended upon the difference of tension of the two ends of the *line*. Electrically speaking, there is no end to a line, for it forms a continuous *circuit*. The two main batteries are in point of fact but one battery, as they are connected directly together by the earth, a conductor of infinitely small resistance. Therefore the difference of tension which gives rise to the circuit is the difference between the + and − poles of the *one* battery, at the points where it is attached to the line. The statement that the grounded pole of each main battery is at zero tension, rests upon the supposition that the battery pole is connected with the earth by a conductor of no appreciable resistance. An instrument inserted between the battery and the ground is included in the circuit, while one placed in the ground wire in the center of the line is not included in it, which accounts for the fact that one is affected and the other is not.

As this discussion has already reached what your readers will doubtless consider an interminable length, I will rest my case here and leave the question at issue to be decided by each intelligent reader for himself from the evidence brought forward. I have endeavored to make my views clear and to confine myself as far, as practicable to the question. Thanking you for your kindness in giving place to my communications, I remain

Yours, &c., Frank L. Pope.

◆

The evidence that the brain is the principal organ of the mind is five fold; 1. The pain of excessive mental excitement is localized in the head. 2. Injury or disease of the brain affects the mental powers. 3. There is a general connection between size of brain and mental energy. 4. The products of nervous waste are more abundant after nervous excitement. 5. Specific experiments on the brain and nerves show that they are indispensable to the mental functions.—*Bain.*

◆

When is the best time to make hay?
When it rains pitchforks.

Electricity.

Holy writ makes mention of lightning in the following passages :— *Exodus* xix. 16; 2 *Samuel* xxii. 15 ; *Job* xxxvii. 3 ; xxxviii. 25 ; xxxviii. 35 ; *Psalms* xviii. 14 ; lxxvii. 18. ; xcvii. 4 ; cxxxv. 7 ; cxliv. 6 ; *Jeremiah* x. 13 ; li. 16 ; *Ezekiel* i. 13, 14 ; *Daniel* x. 6 ; *Matthew*, xxiv. 27 : *Luke* xvii, 24 ; *Revelations* iv. 5 ; xi. 19. Thunder is mentioned in the following passages :—*Exodus* ix. 23, 28, 29, 33 ; xix. 16 ; xx 18, 1 *Samuel* vii. 10 ; xii. 17, 18 : 2 *Samuel*, xxii. 14 : *Job* xxvi. 14 ; xxxvii. 5 ; xl. 9 ; *Psalms* xviii. 13 ; lxxvii. 18 ; lxxxi. 7 ; civ. 7 ; *Isaiah* xxix. 6 ; *Mark* iii. 17 ; *John* xii. 29 ; *Revelations* vi. 1 ; x. 3 ; xix. 6. The wonderful passage from *Job* xxxviii. 35, "Canst thou send lightninge, that they may go, and say unto thee, Here we are !" (original Hebrew, "Behold us !") seems almost prophetic, when viewed in connection with the electric telegraph.

B.C. 600.—The Estruscans (about 600 B.C.) devoted themselves to the study of atmospheric phenomena in an especial manner, and divided the lightnings into those that came from the earth and those that came from the sky; they are said to have drawn down lightning. (See De la Rive's Treatise on electricity, Vol. III., p. 90 ; also Encyclopaedia Britannica, 8th edition. art. Etruscans or Tuscans, pp. 355-361.)

B.C. 600.—Thales, about 600 B.C., is reported by subsequent writers to have described the power of attracting light bodies which is developed in amber by friction. (See Encyclopædia Metropolitana, Vol. IV., art. Electricty. p. 41.)

B.C. 341.—Aristotle, about 341 B.C., records that the torpedo "causes or produces a torpor upon those fishes it is about to seize, and having by that meane got them into its mouth, feeds upon them." He further adds that this fish "hides itself in the sand and mud, and catches those fish that swim over it by benumbing them, and of this some have been eye-witnesses. The same fish has also the power of benumbing men." (See Encyclopædia Metropolitana, Vol. IV., art. Electricity, p. 41 ; also Encyclopædia Britannica, p. 530.

B.C. 321.—Theophrastus, about 321 B.C., mentions that the "lyncurium" (tourmaline?) has similar properties to amber in regard to the attraction of light bodies. Beckmann thinks the "lyncurium" was not tourmaline, but more likely to have been the hyacinth. (See Encyclopædia Britannica, 8th edition, art. Electricity, p. 41 ; also Beckmann's History of Inventions, Vol, I., pp. 86-98.)

A.D. 50.—Scribonius Largus (A.D. 50) relates that Anthero, a freedman of Tiberius, was cured of the gout by the shocks of the torpedo. See Encyclopædia Metropolitana, Vol. IV., art. Electricity, p. 41.

A.D. 1160.— Eustathius, Bishop of Thessalonica (A.D. 1160), in the scholia upon Homer, relates that "Walimer, the father of Theodoric, who conquered, as they say, the whole of Italy, used to emit sparks from his own body ; and a certain ancient philosopher says of himself, that once, when he was dressing and undressing himself, sudden sparks were emitted occasionally, crackling ; and sometimes, he says, entire flames blazed from him, not burning his garments. (See Encyclopædia Metropolitana, Vol. IV., art. Electricity; pp. 41. 42.)

A.D. 1600.—Dr. Gilbert, in his work "De Magnete," published A.D. 1600, adds several substances besides amber to the list of electrics, and states that not only light bodies, but all solid bodies whatever, including metals, water and oil, are attracted by excited electrics. "These experiments he directs to be performed by bringing the excited body near to the end of a light needle of any metal balanced, and turning freely on a pivot like the magnetic apparatus." (See Encyclopædia Metropolitana, Vol. IV., art. Electricity, p. 42.)

A.D. 1617.—Strada, in 1617, published his "Prolusiones Academiæ." In one of these he speaks of a suppositious means of communication between two friends at a distance from each other. "Strada's fancy was this : there is, he supposes a species of loadstone which possesses such virtue that if two needles be touched with it, and then balanced on separate pivots, and the one be turned in a particular direction, the other will sympathetically move parallel to it. He then directs each of these needles to be poised and mounted on a dial having the letters of the alphabet arranged round it. Accordingly, if one person has one of the dials and another the other, by a little pre-arrangement as to details, a correspondence can be maintained between them at any distance by simply pointing the needles to the letters of the required words." A free translation of the poem, in English heroics, was published in 1750, in "The Student, or the Oxford and Cambridge Miscellany" signed Misographos. (See Saturday Review, August 21, 1858, p. 190 ; also Abbe Moigno's Traite de Telegraphie Electrique, pp. 58, 59.)

A.D. 1675.—Boyle, in his "Experiments and Notes about the Mechanical Origin of Electricity," published in 1675, states that warming the electric increases the electrical effect. He also added to the list of electrics, and "ascertained that the converse of all the experiments upon the relative motion of the attracted and attracting body was also true ; namely, that if the substance to be attracted were fixed, and the excited electric capable of motion, their union would still take place." (See Encyclopædia Metropolitana, Vol. IV., art. Electricity, pp. 42, 43.)

A.D. 1675.—Newton, in the year 1675, communicated to the Royal Society the fact that when a plate of glass is excited on one side, the other side also becomes electrical. (See Encyclopædia Metropolitana, Vol. IV., art. Electricity, p. 43.)

◆

The German Cable.

The present situation is not favorable, to encourage a German-American Telegraphic connection, and it is not suprising, that the capital for the building of a new German-English Cable in connection with the English-American Cable Company was not subscribed in Berlin, when a closer view is taken of the business done by the present existing transatlantic companies. The last week exhibit of the French Company, for instance in its total receipt (£1,636) another falling off of £252 compared with the previous week, and the shares are standing at 16¼—¾. The English Company has indeed passable receipts, but the whole business, and more, could easily be sent through one cable, for the second one, since the last break, has not been fished up as yet, as the bad weather has hindered the sailing of the steamer provided with the apparatus for repairing it. It has at a previous time been mentioned that this has been the fifth interruption which the telegraphic communication between England and America sustains, if it had been confined to the cable laid down in 1866. The successfully recovered cable of 1865, has since met with no accident, which is owing as alleged, to the fact that the same passes through a carefully measured (sounded) channel, whereas the one of 1866 was laid during bad weather across rough submarine rocks.

◆

Train Signals.

Mr. Cortland Kimball has invented a lantern signal for railroads, which seems the same as that which we have advertised and described as the invention of Messrs. McKee and Lees, of Neponset, Iowa. It operates by cord and pulley raising and lowering lamps at the will of the operator.

The Tariff Scale.

SPRINGFIELD, Ill., November, 1869.

EDITOR JOURNAL OF THE TELEGRAPH :

While altering my tariff book in accordance with an order in the JOURNAL of October 15, relating to offices on the Albany and Susquehanna Railroad, I noticed, as a result of the combination of tariffs there given, an anomaly in the rate for additional words.

It suggests to my mind the following question. Is there not, in the tariff scale, a uniform relation between the base rate, and the rate for additional words.

It will be seen in the scale for "tariff for additional words," that from a point, say 40, one cent is progressively added to the rate for additional words, after every increase of 15 cents in the base. Apparently then this would say for every fifteen cents in the base, there is one cent for the additional words. But it is not so ; at least, I cannot evolve it through my knowledge of arithmetic.

Can the JOURNAL answer the question ?

Were the scale formed thus,

15 & 1
20 & 2
25 & 2
30 & 2
35 & 3
40 & 3
45 & 3
50 & 4 &c.

the following could be deduced therefrom :

The rate for additional words, will be one cent for every fifteen cents, and fraction thereof, in the base.

The utility of a rule similar to the one suggested would be great. It would concisely and effectively put into the head of every clerical employee an ever ready and useful implement.

I would here suggest that for the better security against error in the transmission of checks, that between the number of words and the amount of the checks, the letter P. be placed for paid messages, and the letter C. be similarly placed for collect messages.

Yours truly, W. W. K.

[NOTE.—We are always glad to receive hints such as the above. They are practical and suggestive. They may not always cause immediate action on the part of those they may concern, yet they affect current thought and help to shape results. The scale of one to fifteen we regard as a good suggestion and worthy of attention, although it is substantially the basis of the present charges.

◆

Telegraphing Extraordinary.

Some singular and amusing specimens of telegraphic incomprehensibility have been recently furnished by the new Indo-Russian line, which was opened a few weeks since. The Bombay *Gazette* says : "It is but due to it that we should acknowledge in our overland summary the remarkable service it has rendered to India as a means of transmitting public news and private advices," and thereupon gives several specimens of Reuter's dispatches from London, as they were received in Bombay. Among these curiosities of telegraphy are the following :

"LONDON, 17th.—Alderman salomon titus salt haromds crawfords refused corrancisy another agriabian assination ireland carecton butury catholic archbiseop Armach.

"21st.—Days insurrection voluntry Barcelona refused disarm erektes bariecbres tatetupl send amaise of severe fighting orders restored Jestik feary pattot cornuned sonied.

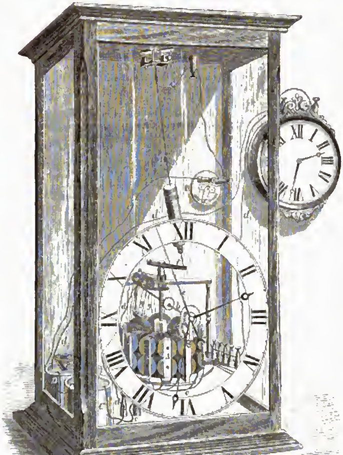
"27th.—Having change prefery by shareholders against manger directors Albert Assurance for consgnal conweed Saturday lgnid-otlors examined no cancil fremid on part pirretors cose adanten.

"29th.—spiscw clarundas al ountberal association lord been an continent head opportunity collectured opinions seen persons who exercise influence an bestiwes Europe and believe at no time since prussians austrians pact existed faviar paus pant monte montement blessing peace."

These are about the hardest conundrums we have ever tried, and failed, to guess.

BRADLEY'S ELECTRIC CLOCK.

It is to be regretted that the high hopes entertained a quarter of a century ago concerning electric clocks have failed to be realized, nothwithstanding the indefatigable labors of Shepherd, Bain, Dent, Airy, Wheatstone and others. The various modes heretofore employed for obtaining or transmitting the necessary motion may be resolved into two systems with modifications, viz., that of Shepherd and that of Bain. In the first, the vibrations of the pendulum were caused by the repeated impulses of either a small spring or a weight; the attraction of an electro-magnet being employed to relieve the pendulum from the action of the spring or weight during the reflex vibrations. In the second, the pendulum was caused to oscillate by means of permanent steel magnets and a helix so arranged that intermittent currents acted to produce intermittent repulsions or alternate attractions and repulsions.



Dr. Bradley, the inventor of the clock we here illustrate, has adopted an entirely new system of propulsion for the primary clock of a series, as well as an entirely new system of producing an isochronous movement of a number of secondary clocks at distances from the primary one. He does not, however, propose to employ electricity for the motive power of a single clock, as he considers, very reasonably, that the winding up of a weight once a week is preferable to the care and expense of a battery; but as a battery is requisite for the secondaries, the additional trouble and expense of running the primary clock by the same means is so little that he considers it better to use it.

The illustration represents a primary clock and one secondary, the latter—represented at the right hand—being supposed to be in some distant place. The primary clock with its own and the secondary battery are all represented in the same glass case to facilitate the explanation. The battery may, however, be arranged in any other convenient place.

The primary clock is actuated by a small electro-magnetic engine, A, the upright rotating shaft, *a*, of which has upon it an endless screw engaging in a worm-wheel on the spindle, *b*, of the second-hand, *e*, and a pinion on the latter spindle actuates the ordinary face-wheels giving motion to the minute and hour hands. The most important feature of the invention, however, is the mode of applying the conical pendulum, B, and the means by which such pendulum is made automatically to compensate for variations in the electric force. This pendulum is also provided with an ordinary mercurial compensation for variations of temperature, and therefore cannot fail to keep very correct time. Before describing this latter compensation, we will explain that the cup, C, is the battery of the primary clock, and that, D, the battery for the secondary clock. The circuit wires of the primary battery are indicated by letters, *c*, *c*, and those of the secondary one by letters, *d*, *d*. One pole of the primary battery, C, is connected with the helices of the electro-magnets of the engine, A, and the other is in connection with the pendulum-rod, the lower end of which is terminated by a piece of platinum wire, which enters a slot in an arm, *f*, made of some insulating substance, attached to the upper end of the upright rotating shaft, *a*, of the engine. On either side of the slot in this arm is secured a light platinum wire spring having metallic connections for carrying the current of the engine battery, C; and the platinum wire of the pendulum-rod playing in the slot of the arm, *f*, coming in contact with these springs, closes the electric current upon the engine, causing the movement of the primary clock and pendulum. The centrifugal force generated in the pendulum by its conical gyration tends to throw it out; but the moment it is thrown beyond the periphery of a given circle, at the plane of contact with the springs aforesaid, the circuit breaks, and the centrifugal tendency is arrested by the temporary suspension of the electric force. The pendulum, therefore, rotates or gyrates just at the point of opening and closing the circuit, and is, so to speak, constantly helping itself to the exact amount of force necessary to maintain it at a uniform amplitude of gyration under the variations in the electric force of the battery or engine.

The secondary clock is a mere dial with hour and minute hands, and with a ratchet-wheel on the minute hand operated by a pawl, which is actuated by the armature lever of an electro-magnet, with the coils of which the secondary circuit wires, *d*, *d*, are connected. The second hand spindle, *b*, of the primary clock forms a part of this circuit, and so does one of a series of little insulated cups, *i*, containing a globule of quicksilver. The circuit remains open except for an instant during the rotation of the spindle, *b*, when it is closed by the point of one of a series of needle-like arms, *g*, on the said spindle dipping into the globule of quicksilver in one of the little cups, *i*. This closing of the circuit once in every minute causes the armature of the magnet of the secondary clock to be attracted, and so causes the pawl to act upon the ratchet-wheel to move the minute hand. Any number of secondary clocks in the circuit, *d*, can be worked in the same way by the one battery, D, and all be made to keep time with the primary clock, and in fact so can several series or trains of such clocks. It is for the latter purpose that several quicksilver cups, *i*, and circuit-closing arms, *g*, are used, one for each series or train of clocks. Each of the cups, *i*, is connected with a separate branch circuit for one series of clocks; and the arms, *g*, are so arranged as to close these branch circuits one after another in succession, so that the labor of operating more than one series is never thrown upon the battery, D, at the same time.

A great advantage is obtained from the substitution of the conical for the oscillating pendulum, in the certainty of closing the circuits. The oscillating pendulum closes the circuit towards or at the close of each oscillation when its momentum is checked, but the momentum of the conical pendulum is uniform throughout each revolution or gyration.

Dr. Bradley has had in successful operation in his office during the past five months a primary clock, driven by a weight and actuating and governing several secondary clocks operated isochronally by electricity. In the recent Fair of the American Institute he had in the main building a primary clock run by electricity, and working two secondary dials, one in the sewing machine room and another in the restaurant.—*American Artisan.*

Brazil.

The ratifications of the powers accorded in the international telegraph concession made to Ballestrim having been exchanged, Brazil should, by the terms of the concession, be placed in telegraph communication with Europe and the United States within three years by laying a cable from Paris to one of the French Antilles, to which the European cable will be laid, and from which the communication with the United States will pass by Hayti and St. Thomas. The parties to the convention are Brazil, Denmark, France, Hayti, Italy and Portugal.

The Anglo-Indian Telegraph Cable.

The steamer Great Eastern sailed from Portland on the 6th instant for Bombay, carrying the deep-sea cable which is to be laid between the latter port and Suez as a link of the great Anglo-Indian Telegraph. The tanks of the Great Eastern contain 2,735 nautical miles of cable, and her companion ships, the Hibernia, Chiltern and Hawk, carry among them 1,225 miles more, making a total of 3,600 nautical, or about 4,050 statute miles. This length will suffice for the communication between Bombay and Suez by way of Aden, and will join the present Malta and Alexandria line Another cable is projected, to be laid from Falmouth to Gibraltar and Malta, and its completion will unite Bombay and the British fortresses in the Mediterranean along one line of submarine telegraphy, which will be unbroken except at Suez.

The amount of cable carried by the Great Eastern weighs 5,542 tons. She has, besides this, 3,824 tons of fuel, 6,499 tons of coal and apparatus and appliances, making up a freight of 21,000 tons in weight, and of about three millions sterling in value. The speed at which the cable is to be laid must not exceed five knots an hour.

Western Union Telegraph Company.

TRANSFER OF OPERATORS.

Name.	*From.*	*To.*
John H. Dennison	Kentville, N. S.	Wolfville, N. S.
Geo. S. Marcyes	Rye Beach, N. H.	Portland, Me.
W. N. Sperry	New Haven, Conn	Bridgeport, Conn
E. A. Beardslee	Boston, Mass	Bridgeport, Conn
Miss Smith	Garrison's, N. Y.	Hudson Dp't.N.Y
E. H. Crawford	Auburn, N. Y.	Syracuse, N. Y.
C. H. Hambright	Atco, N. J	Harrisburg, Pa.
J. H. Simpson	Atlantic City, N. J.	Philadelphia, Pa.
J. Brady Lyndall	Harrisburg, Pa.	Philadelphia, Pa.
W. E. Bingham	Manumuskin, N. J.	Lewes, Del.
L. F. Butz.	Morristown, N. J.	Madison, N. J.
Wm. Dyer	Philadelphia, Pa.	Washington, D.C.
Geo. Snyder	Philadelphia, Pa	Boston, Mass.
A. J. King	Princess Anne, Md.	Smyrna, Del.
S. S. Shroff	Princeton, N. J.	Rahway, N. J.

APPOINTMENTS.

David Lyons, Kentville, N. S.
Gilbert Morris, Shediac, N. B.
J. H. Prink, Bangor, Me.
C. H. Lyon, Arlington, Vt.
Alfred Le Roy, Cohoes, N. Y.
R. Leonard, Fair Haven, Vt.
G. P. Holton, Grout's Corners, Mass.
C. A. Goodwin, Fitchburg, Mass.
C. M. Newton, Lansingburgh, N. Y.
F. E. Nims, Nashua, N. H.
J. A. Goodwin, Porter's Station, N. Y.
Geo. P. Reynolds, East Albany, N. Y.
H. Mack, East Albany, N. Y.
M. C. Joseph, Garrison's, N. Y.
W. B. McEnroe, Hudson, N. Y.
James Sellick, Hudson, N. Y.
B. F. Johnson, Baltimore, Md.
Oliver McMullin, Bedford, Pa.
W. A. Morrow, Bordentown, N. J.
Amasa G. Taylor, Elizabeth, N. J.
Lulu L. Smith, Lebanon, Pa.
Geo. P. Shaw, Manumuskin, N. J.
Harry E. Moss, Morristown, N. J.
James B. Norris, Philadelphia, Pa.
H. H. Johnston, Philadelphia, Pa.
B. F. Johnston, Princeton, N. J.
Edward W. Lee, Riverton, N. J.
William A. Day, Wilmington, Del.
W. B. Griffiths, Wilmington, Del.

LEFT THE SERVICE.

G. H. Bowker, Bangor, Me.
G. C. Kendall, Arlington, Vt.
J. A. Wilbur, Fairhaven, Vt.
G. W. White, Grout's Corners, Mass.
L. E. Bathrick, Fitchburg, Mass.
Miss E. G. Smith, Lansingburg, N. Y.
R. W. Farley, Nashua, N. H.
E. A. Fitcham, Porter's Station, N. Y.
Frank Moore, East Albany, N. Y.
George P. Reynolds, East Albany, N. Y.
D. Hermanos, Hudson, N. Y.
John F. McConnell, Baltimore, Md.
Hetty M. Ogle, Bedford, Pa.
John Hartman, Lebanon, Pa.
M. L. Van Doren, Madison, N. J.
Jacob Stauffer, Riverton, N. J.
W. A. Day, Wilmington, Del.

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An Old Hand Reports Progress.

ROCKLIN, Cal., November 12.

EDITOR JOURNAL OF THE TELEGRAPH :

I know of nothing special to communicate in the way of news unless it be the fact that I was married in Sacramento on the 7th of January last to Miss Hattie M. Osborn ; also, had a fine daughter (9½ lbs.) born on the 8th of November. As usual, we think "it's the greatest baby in the world," and it is to us. Remember me kindly to all, and accept the best wishes of truly yours,

H. N. STEVENS.

Dr. Bradley's Clock and Works.

We had great pleasure a few days ago in visiting the shops of Dr. Bradley, of Jersey City, and examining his electric clock, a sketch of which we have given on our fourth page. It is exceedingly simple and ingenious. The governor or pendulum is its chief feature. Acting as a part of the circuit by which motion is communicated, the centrifugal tendency is checked the instant it leaves its contact with the arm which propels it, and is, in like manner, sustained by its contact. The description is interesting and excellent.

Dr. Bradley has a large force manufacturing the new printing instruments of Pope & Edison, which are remarkable for their ingenuity and simplicity. A single wire is used. In the circuit are two magnets, one more responsive than the other. The primary motion of a crank ratchets up the type wheel to its place by the more responsive magnetic arm. Arresting the motion of the crank allows the second magnet, which makes the stroke, to act. The return of the striking arm moves the paper forward. Thus three motions are made by a single wire and by the same current. The less responsive magnet is made so by lightness and quickness of contact in the primary motion. It acts when time is given by detention to connect. We are indebted to Mr. Ecklin, the intelligent foreman, for the inspection of this minute but effective instrument.

In an adjoining room we were allowed to see the Bradley process of filling the wire spools, which is executed by Miss Knight, an intelligent and skillful lady, to whom Dr. Bradley has assigned this duty.

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Patents of the United States Granted to George Little, of Rutherford Park, New Jersey.

No. 91,240, patented June 15, 1869.

I claim—

FIRST.—The segment, *d*, and lever, *c*2, constructed and applied substantially as specified to give the electrical pulsations for the respective characters by the movement of the one lever substantially as set forth.

SECOND.—The lever, *c*2, fitted to swing on the shaft, *b*, and provided with a friction clamp to move the shaft, *b*, and effect the feed of the paper, when the lever, *c*2, is depressed to close the circuit substantially as set forth.

THIRD.—The punch, *i*, set in the yoke, *n*, upon the arms, *l*, in combination with the vertical standard, *k*, carrying the die, 7, substantially as set forth.

FOURTH.—The feeding disks, *q*, arranged to act on each side of the punch, *i*, and against the standard, *k*, substantially as set forth.

FIFTH.—The standard, *k*, sustained in the tube, *k*, and fitted so that a slight end movement can be given to the same, in combination with the feeding disks, *q*, for the purposes set forth.

SIXTH.—The magnet, *u*, and loose or self-adjusting extension poles forming a break or stop, substantially as set forth.

SEVENTH.—The magnets, *n*, and extension poles, *s*, in combination with the feeding mechanism, punch and circuit closer, *u*, substantially as and for the purposes set forth.

EIGHTH.—A single punch for perforating and embossing paper for a telegraphic communication, actuated by the direct action of an electro-magnet, in combination with mechanism for giving motion to the paper between the various perforations forming the letters or characters, substantially as set forth.

No. 91,241, patented June 15, 1869.—Apparatus for perforating paper for automatic transmitters.

I claim—

FIRST.—The method herein specified of perforating or indenting paper to be used in transmitting a telegraphic message, by a magnet acting upon a lever and punch combined with a die, substantially as set forth.

SECOND.—The aforesaid magnet, lever, punch and die, in combination with conducting and non-conducting surfaces, acting to give the pulsations of electricity through the magnet for composing a telegraphic message, substantially as set forth.

THIRD.—The lever, *k*, actuated by the armature and magnet in combination with the punch and feeding mechanism, substantially as set forth, whereby the movement of the paper is checked when the punch is operating, substantially as specified.

FOURTH.—The wheel, *d*, and roller, *h*, in combination with the lever, *k*, and punch, *n*, substantially as set forth, for stopping the motion of the paper while being punched or embossed, and bringing the feeding motion into operation as the punch is released.

FIFTH.—The non-conducting surface, *s*, and its pins or conductors, *t*, in a clamp, *g*, lever or key, *f*, and spring, *i*, substantially as and for the purposes specified.

SIXTH.—The lever or key, *b*, jointed near one end of the divided ring clamp, *g*, and provided with a roller, 3, to act against the projection, 24, upon the other end of the clamp, for closing the same around the cylinder or disk, in combination with the adjusting screws, 4 and 5, substantially as and for the purposes set forth.

SEVENTH.—The punching mechanism and the means for moving the paper, in combination with the key, *f*, or its equivalent, that simultaneously controls the action of the punch and the movement of the paper.

No. 96,330, patented November 2, 1869.—Perforating paper for telegraphing.

I claim—

FIRST.—A wheel for feeding along a strip of paper to be perforated, in combination with an armature swinging on the same axis as the feed wheel and an electro-magnet, substantially as set forth.

SECOND.—The punch, *i*, and presser plate, *e*, in combination with the feed wheel, *b*, die, *c*, and sleeve, *f*, substantially as and for the purposes set forth.

THIRD.—The magnets, *h* and *i*, arranged as specified in combination with the lever, *g*, in the fulcrum, 7, that is one pole of the magnet, *h*, and with the circuit changer, *n*, substantially as and for the purposes set forth.

FOURTH.—An apparatus for composing telegraphic communications, consisting of a magnet, lever punch and die, to perforate or emboss the paper, in combination with a feed wheel and an electro-magnet to move said feed wheel progressively, substantially as set forth.

FIFTH.—Mechanism for feeding the paper by magnetism and mechanism, actuated by an electro-magnet for perforating the paper, in combination with mechanism for closing the circuits to the respective magnets in such an alternate manner as to compose a telegraphic communication on a strip of paper, substantially as set forth.

SIXTH.—The tablet, *t*, formed of conductors, arranged substantially as set forth, in combination with a moveable stylus or circuit closer, that is to be moved in contact with the conductors of the tablet, to produce alternate pulsations of electricity for feeding the paper and punching the same by mechanism.

No. 96,331.—Apparatus for perforating paper for telegraphing. Patented November 2, 1869.

I claim—

FIRST.—The circuit closer, *p*, in the groove of the cylinder, *a*, in combination with the band, *s*, key, *n*3, and finger, *v*, substantially as and for the purposes set forth.

SECOND.—The feeding disk, *c*, on the shaft, *b*, of the cylinder, *a*, in combination with the frictional connection, *d*, and holding magnet, *n*2, for moving the paper by the direct action of the cylinder, *a*, and arresting the movement of the paper when the punch is acting, substantially as and for the purposes set forth.

THIRD.—The magnet, *l*, in combination with the magnet, *h*, lever, *f*, punch, *n*, and circuit changer, *m*, for perforating the paper, and then drawing back the punch by magnetism, substantially as set forth.

FOURTH.—The circuit changer, *m*, in combination with the magnets, *h* and *r*, and lever, *f*, to direct the electro-current substantially as set forth.

No. 96,332.—Electro-magnetic Motion.—Patented November 2, 1869.

I claim—

FIRST.—An electro-magnetic motor formed with armatures upon a spindle in combination with stationary magnets and governor balls, applied in substantially the manner specified to communicate an end movement to the spindle, and regulate the speed by the friction resulting from such end movement, substantially as set forth.

SECOND.—The cylinder, *k*, collar, 5, sleeves, *n* and *g*, and governor balls, *p*, arranged and applied substantially as set forth, in combination with the spindle, *d*, armatures, *e*, and electro-magnets, *b*, *c*, substantially as set forth.

THIRD.—The adjustable step, *l*, and spring, 6, in combination with the spindle, *d*, carrying the armatures, *e*, and friction collar, 5, so that the spindle, *d*, and its parts are sustained or balanced by the said spring, 6, for the purposes and as set forth.

No. 96,333.—Automatic Telegraph Apparatus.—Patented November 2, 1869.

I claim—

FIRST.—The adjustable brush, 20, in combination with the roller, *b*, and stylus, substantially as and for the purposes set forth.

SECOND.—The stylus formed of a disk, with a platina or non-corrosive edge, in combination with the arm, *n*, and roller, *b*, as and for the purposes set forth.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

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NEW YORK, DECEMBER 1, 1869.

Volume III.

Never did Young America pass the legal line which separates the boy from the man with a keener sense of what was possible for him, than the world seems to do to-day. There are consummations of projects on every side, which startle and dazzle us by their grandeur and success. The past year has been prolific of achievements which have been the laugh and scorn of millions of men. Columbus was never more snubbed than the pioneers of the Pacific Railroad, or the heroic Frenchmen who has just welcomed the brilliant fleet which has steamed from Alexandria to the Indian Ocean. The ease, also, with which 4,000 miles of ocean cable were laid from Brest to Duxbury, was a triumph of engineering skill and forethought. All these are victories over time and the ocean. Five thousand miles of weary battle with the Antarctic, with the angry waves around the Cape of Good Hope, are cut off forever. Where Pharaoh and his host found a grave beneath the tumbling walls of the parted sea, a cable will soon rest, and a thousand gay steamers skim over the surface of a calm inland sea to the great Indian Ocean. So of the Pacific rail, which weds the oceans, yet, to the gladness of many a traveler, provides stepping stones by which their waters may not touch the daintiest foot. Other triumphs are before us equally great. The whole world, in both its moral and material elements, seems thoroughly awake. There is enterprise, and popular elevation, and a beating of national pulses toward fraternity and generosity, and peace and intelligence, which make one proud of life in such an era. We fully sympathize with Napoleon in his recent salutation to the French Senate: "We have reason to be proud of our epoch. The progress of science draws nations closer to each other. While America unites the Atlantic and Pacific, everywhere capital and intelligence combine to connect by the electric wire all nations."

The telegraph system in America has developed largely during the past year. It touches closer and closer every phase of social life and commercial industry. The smallest and remotest towns demand it as a necessity of existence. It is being liberally provided. At least 10,000 miles of wire have been erected during the past year for this purpose, and new demands still come. It requires no governmental process to attain their end. No fat contractor stands between them and the click of the magnet. Wherever a community will give a room and an operator, the wires are carried. So goes on the spinning of the vast web near the center of which we sit and wonder, and admire and write. To us the TELEGRAPH loses none of its early attractions. There is not a painting which Reubens or Raphael ever drew which so speaks to our imagination and hope as the wire, black with city smoke, which casts its thin shadow across the little room on Broadway where we perform our accustomed labor.

◆

A Sensible Foreign Correspondent.

After all that the New York *Herald* has written in favor of the assumption of the American Telegraph by Government, it is refreshing to read in its Belgian correspondence the following quiet and sensible acknowledgment. We wonder somewhat at the bravery of its avowal. It is the point of the whole scheme which makes and must ever make a govermental telegraph obnoxious to the American people. The telegraph held by government as a political aid, is offensive to the public instincts, and can never long be tolerated, if, unhappily, its inauguration as an adjunct of our state machinery is ever attempted:

> A great feature with your papers is a free use of the telegraph for news purposes; it must be at a great outlay. You have a press association, which is more favorable, at the same time dearer, than our *Agence Havas* and *Agence Reuter*, which keep our journals completely at their discretion. Here the telegraphic system is good; it works well and gives satisfaction to the people. It is under the control of the government; that is, two divisions of it. The principal netway is run by the government. There is a secondary one, composed of a few unimportant lines, under private companies. There has been an effort made to unite the two under private guardianship but without any prospect of success, for there are political reasons which induce the government never to give up its control. Outside of such reasons, and looking at the question in a view of industrial economy, there is no question that it would be best to leave all such enterprises to individual action.

The working of the Belgian lines may be as good as any on earth. With that we have no contest. Government can employ first-class talent if it pleases. What it undertakes, nothing of necessity prevents its doing well, if within its sphere. But, for a government like ours, which signifies, to a large extent, a party in the ascendant, the possession of the telegraph for political power is, and ever must be in the highest degree offensive. The gentleman who, in Berlin, sat down and wrote the above to the New York *Herald*, placed language in our lips felicitously stating our whole plea. "*There are political reasons which induce the Government never to give up its control. Outside of such reasons, and looking at the question in a view of industrial economy, there is no question that it would be best to leave all such enterprises to individual action.*" How completely does an intelligent correspondent, resident among the activities which he describes, stultify the senseless diatribes of a local press which seeks to ruin that which it impotently attempts to rule. Were there no margins to make fortunes on by pseudo philanthropists out of the government crib, we would never hear of such a project in American society as the giving up to politicians of the popular industries. The true heading of the bills and pamphlets of the virtuous gentlemen, who will soon again be found running through the corridors at Washington with their postal telegraph schemes, should be "AXES TO GRIND."

Hon. Amos Kendall.

We were of necessity brief in our notice of Mr. Kendall's death in our last issue, the tidings having come to us as we were closing the paper for the press. In this opening number we designed to refer to it at length, yet felt that it was due to Mr. Kendall's memory that some one fully competent to the task, by even closer familiarity with the deceased than we enjoyed, should perform that duty. Professor Morse is the only one who can do Mr. Kendall's memory the ample justice it merits and must receive. To him we appealed. We give his answer. Many will be sorry to see the evidence of the effect on Mr. Morse's health of the painful accident from which he has suffered so much, yet so cheerily, during the past summer. We hope he will emerge from it unbroken, to enjoy, for many years to come, the esteem and honor he has so fairly won and which is so widely accorded.

> 5 West Twenty-second street,
> NEW YORK, Nov 23, 1869.
>
> MY DEAR SIR: I have had your note requesting of me some notice of Mr. Kendall for your paper for some days on my table, hoping I might be able to comply with your request. I can only say "the *spirit* is willing but the *flesh* is weak." The demand upon me for the little strength that I can devote to writing, except in the way of mere business and domestic matters, leave me no time for such a labor. All I can say is that as I gain strength, which is *slow* but yet sure, I will give the matter consideration. There need be no haste. Mr. Kendall has made his mark indelibly, and time will show it more bright. His telegraphic services ought by all means to be recorded, but in order to do him justice I require an access to papers and documents which I have not strength enough to examine. I will see you as soon as I can get away from my confinement.
>
> Your friend as ever, SAMUEL F. B. MORSE.

We shall await this memorial of Mr. Kendall with satisfied impatience. Every other great pioneer in a work so prolific of good to the entire race, should also have his work appropriately commemorated. We are not satisfied to see those it has made rich contented with their mere golden triumph. That will soon perish except as its fruits find their way into appropriate charities, or bless in rills of quiet beneficence, the society in which they flow. Mr. Cornell has illustrated his success in a school of learning which is already known throughout Christendom. Mr. Sibley has just added to his gifts a memorial edifice and tribute to the friends of his boyhood on the lot where he and his estimable wife were born in North Adams, Mass. Mr. Kendall has used his less plethoric purse with like generosity in aid of the church to which he was united by bonds of unusual affection, and to the endowment of public charities which he originated and rendered perpetual. We are glad to record such acts. They are sermons eloquent and influential of good. They tone coming generations to a higher and more magnanimous living. They make wealth shake hands with beneficence, and leave the marks of Christ's feet on this too hard earth.

As we said before, Mr. Kendall was our friend. We miss him as a son misses his father. We shall ever remember him with affection and gratitude.

•••

Professor Morse's Report.

We were agreeably surprised by a call from Professor Morse, just as we had closed for the press, who came to present us with his Report to Government as United States Commissioner to the Paris Universal Exposition of 1867, on telegraph apparatus and the processes of Telegraphy. More of this hereafter. We were far more glad to see the man than the book, good as that no doubt is.

OFFICIAL STATEMENT.

Western Union Telegraph Company.

	Oct. 1868.	Oct. 1869.
Total Receipts...........	$680,311 81	$638,926 74
Total Expenses..........	410,604 17	437,533 43
Net Profits..........	$269,707 64	$201,393 31

◆

The semi-annual meeting of the Board of Directors of the Western Union Telegraph Company, for the examination of its affairs and the declaration of the January dividend, was held to-day, December 1, at the executive rooms of the company, 145 Broadway, New York.

A dividend of two per cent., payable January 21, 1870, was declared, the transfer books to be closed December 20, and so remain until January 21.

◆

Several applications having been made for the index to Vol. I, we take occasion to say that on account of a neglect to page the first volume successively through the year, an index was rendered impossible and was therefore not printed.

We take also occasion to say that any number except No. 5, Vol. I, we can supply to those who desire them, as also Volumes I and II, bound in neat cloth, at $2.50 per volume.

The Suez Canal.

Port Said, Nov. 22.—The ship Hawk, belonging to the telegraph service, has passed through the canal. She will lay a telegraph cable from this point to Suez on the bottom of the canal.

Frey's Open Circuit Keys.

We would call attention to the advertisement of Mr. Frey, respecting his key, of the merits of which we have already freely spoken. As we have already said, it is the only practical self-closing key we know of, unless we accept the ordinary key without spring, which is an awkward article where much work is done. Where these keys are introduced all the relay points must be reversed. By this change, manipulating the open circuit closes the local connections by the back instead of the front stroke, and the locals are out of circuit when the line is idle.

◆

We had designed to have introduced this volume of the Journal by a suitable likeness of the President of the Western Union Telegraph Company. We have been prevented doing so chiefly by the unwillingness of Mr. Orton to grant a photograph, without which, of course, our design was impossible. Some men naturally hate publicity of this kind. We frankly confess we do not share it. We would as soon put our cadaverous countenance on paper as write an editorial, if it would give a smile of pleasure to the old friends who labored with us in other and younger years. We think it natural that 6,000 men should desire to see their chief executive officer. We have given them that of Prof. Morse to embellish Volume II. We hope soon to give Mr. Orton, and will endeavor to give every face whose work or duty renders him prominent in the service in which we all toil.

Telegraphers' Insurance.

Among the pleasant things of the past year the success of the Telegraphers' Life Insurance must be counted as among those which have left the best odor, and appeal most to our gratitude and satisfaction. It has been organized two years and has provided $4,000 for bereaved families which, but for it, must have suffered. It has not only paid the money, but the knowledge to a dying brother that his family were to be provided enough to fill the dark gap which comes at death, irradiated his remaining life, and thus was doubly blessed. Over 600 persons are now pledged to one another to give one dollar each to the family of the first who falls. It is a blessed work and should be much more extended. It encourages the fraternal feeling and educates to generosity. The re-active blessing of a good action is itself a grand compensation, and although this association is for mutual benefit, yet it has all the aroma of beneficence. Among its members are several ladies. Their payments are always prompt. Their money comes with the strongest evidences of their interest in the work.

Some, of course, have separated themselves and left the membership. But that was an expected and a common result. They weary giving, perhaps cannot give. We make the discount and charge half to our weak nature, which wearies even in that which yields most of good, and half to an empty purse. It has cost its members 1¼ cents per day, less than a ferry ticket, less than half the price of a morning paper, less than the fifth of a cigar per day. But—well, they weary. We can't be angry at them, for we ourselves are weak. Yet we wish it were not so.

Nevertheless 600 members remain. It is a good band. Let us go on. The gratitude of the orphan and the widow will be ample reward.

◆

Mr. R. S. Culley, well known as a careful writer on electricity, and author of one or more valuable treatises on the telegraphic art, and who is now the engineer of the Electric and International Telegraph Company of Great Britain, has been selected as the Government Engineer of the English lines when they are transferred to the management of the State. The change to the English people will be apparent only in the modification of the tariff between some points, and the ability to reach some others where the business has been too light to justify a private company in maintaining an office. All the old and experienced officials will be retained, and the whole force practically remain as now.

Married.

Patterson—Davis.—On Tuesday, November 9, at the residence of the Hon. L. C. Davis, by Rev. Wm. Ginnea, Mr. R. Y. Patterson, of the Western Union telegraph office, Cadiz Junction, O., to Miss Flora A. Davis, of New Camerstown, O.

"Mr. Patterson has been engaged for a number of years in telegraphing, and whose prompt attention to duty and kindness to all, have made him a general favorite and an honor to the fraternity."

Died.

November 25, of consumption, at her residence, 353 Grand street, Brooklyn, Elizabeth, wife of Wm. Connor, of the Western Union Telegraph Office, New York. Mrs. Connor has been long a great sufferer, but has endured with great patience and fortitude. She dies regretted by a large circle of devoted friends.

Executive Orders No. 86, 88, 89 90.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
November 27, 1869.

Referring to Executive Order No. 25, it is now ordered that

Vicksburg, Miss.,
Parkersburg, West Va.
Wheeling, West Va.,
Cumberland, Md.,
Macon, Ga.,

be, from and after this date, added to the list therein designated as "Night Offices."

Wm. Orton, President.

TARIFF BUREAU.

Semi-Monthly Circular.

December 1, 1869.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since November 15, the date of the last tariff order. Please note them in your tariff book:

NEW OFFICES.

176 Arlington, Ga.
181 Braddock's Field, Pa.
436 Brookville, Iowa.
108 Doe Gully, W. Va.
170 Dennison, O.
457 Ft. Scott, Ks.
Fossil Creek, 110 more than Lawrence, Ks.
* Greensburg, N. J., formerly W. U. office.
426 Guthrie, Iowa.
407 Leighton, Iowa.
41 Mont Clair, N. J.
304 Marion Jn., Ala., reopened.
406 Mitchell, Iowa.
* 57 Middlefield, N. Y.
130 Miller Farm, Pa.
Navy Yard, Washington, D. C. Tariff 10c. more than Washington.
368 Osage, Mo.
Pond Creek, Ks., 160 more than Lawrence, Ks.
40 Philmont, N. Y.
213 Piketon, O., reopened.
307 Rock Island Junc., Ill.
181 Salina, Athens Co., O.
406 St. Ansgar, Iowa.
406 State Line, Iowa.
409 Smithton, Pettis Co., Mo.
89 Swedesboro, N. J.
368 Tallula, Ill.
* Union Springs, Ala.
Wilson's Creek, Ks., 108 more than Lawrence, Ks.
377 Wever, Iowa.

NEW OFFICES ON OTHER LINES.

	Tariff for other lines.		*Leaves this line.*
Chatham, Que., same as Aylmer, Que.			
Creemore, Ont., same as Bradford, Ont.			
Greensburg, N. J..........	30	2	Lambertville, N. J.
Lakefield, Ont., same as Lindsay, Ont.			
Union Springs, Ala.......	100	6	Columbus, Ga.

OFFICES CLOSED.

Golden City, Col.
Martindale, N. Y.
Norwood, N. J.
Valley Falls, N. Y.
Chester, N. Y.

GENERAL INFORMATION.

All offices in District L (except those east of Dunkirk), M. O. and Pacific Division, will hereafter check Salamanca, N. Y., in Square 130, direct, using "square rate."

The tariff "for other lines" to Henderson, Ky., is 80 and 6 from Louisville, Ky., to which point business for Henderson will be sent and checked hereafter.

Business for offices on the Union Pacific Railroad, which has heretofore been checked to Corinne, Utah, will hereafter be checked to Ogden, Utah. The tariff will remain unchanged.

Ashland, N. H., office closes at 6 P. M.

The tariff to Oakland, Cal., will hereafter be same as San Francisco, Cal.

The P. O. Address of Abington, Pa., is Waverley, Luzerne Co., Pa.

There is an office at West Springfield, Mass., square 32. The name of the office as printed in the book is Mittineague, Mass.

Martin, Texas, in Journal of October 1st, should read Morlin, Texas.

Troy, N. Y., is incorrectly given in the tariff book as in square 25. It is in square 46. Jones' Station, O, in Square 333, should be Square 233.

Milford, O., and Morristown, Ind., are also incorrectly located. They should be entered as follows: 233 Milford, Hamilton Co., Ohio., and 261 Morristown, Shelby Co., Ind.

Offices in Districts A, B, C, D, G and H, should disregard the order in last Journal relating to Newburgh, N. Y.

On and after December 1st, offices having "Special Sheet A" will charge the following rates:

Milwaukee and Kenosha, Wis., and Waukegan, Ill., ten cents more than "special rate" to Chicago, Ill.

Lafayette and Logansport, Ind., same as "special rate" to Indianapolis, Ind.

In computing tariff to offices on Albany and Susquehanna Railroad, the "special rate" will not be used. See Journal of October 15.

William Orton, President.

Telegraphers' Mutual Life Insurance Association.

ASSESSMENT NO. 9.

F. H. Seibert,
B. F. Bush,
Sam Porter,
Joshua C. Smith,
Noah Trissell,
S. P. Peabody,
M. C. Newman,
J. M. Armstrong,
G. D. Butler,
J. W. Crouse,
J. L. Edwards,
Wm. Blanchard,
Thomas W. Russell,
James A. Murray,
J. S. Hunter,
D. H. Ogden,
A. H. Seymour,
Josiah A. Cura,
R. Cunningham,
I. W. Lewis,
J. B. Helme,
J. W. Hay,
W. H. Stanton,
H. L. Barber,
B. D. Hubbard,
O. W. Chapin,
J. L. Martin,
Wm. Spinner,
R. W. Marriott.
Albert J. Jarvis,
W. H. Fanning,
John K. Calvart,
John T. Spear.

ASSESSMENT NO. 10.

Andrew Nelson,
H. S. Smithers,
W. H. Stiegelmeir,
Geo. J. Whitehead,
Sam. Ward,
R. B. Woolsey,
J. M. Bechtel,
T. S. Proctor,
J. D. Easterlin,
E. L. Catterfield,
Lizzie H. Snow,
T. J. Hewlett,
A. S. Brown,
T. P. Nightingale,
H. F. Makepeace,
A. F. Swan,
C. D. Littlejohn,
Gerritt Smith,
J. T. Maxwell,
W. H. Hill,
Albert Baur,
Albert Griggs,
G. W. Baldwin,
A. R. Brewer,
Geo. E. Spencer,
E. C. Cookey,
O. M. Gay,
Mattie L. Smith,
H. C. Fardon,
Thos. McBride,
A. H. Seymour,
W. H. Clark,
Thos. Allen,
*J. W. McDonald,
*Marcus A. Erwin,
*John Doran,
*Hugh D. Scott,
Richard O'Brian,
M. H. Kerner,
Josiah A. Cure,
A. B. Chandler,
J. Mitchell,
T. Dolan,
M. S. Roberts,
C. H. Vogel,
A. K. Ingraham,
Joseph Knittle,
G. F. Durant,
Alice A. Durant,
A. H. Watson,
W. H. Sawyer,
J. W. Lewis,
John Trevor,
G. A. Redman,
C. S. H. Small,
N. H. Rugg,*
James Merrihew,
William Corley,
Abram P. Eastlake,
W. J. Denver,
Henry Denver,
W. H. Hoyt,
C. R. Case,
J. Feary,
W. H. Monka,
B. McMurtry,
B. W. Patterson,
Geo. L. Lang,
R. N. Norton,
W. W. Wall,
E. B. Clarke,
W. D. Mann,
D. L. Findley,
J. A. Swift,
A. H. Kanode,
W. W. Thweatt,
J. P. Cassidy,
W. F. Shiebler,
H. A. Clute,
J. C. Christie,
C. L. Chase,
Ira Dewitt,
D. R. Downer,
J. D. Reid,
Jonas S. Brown,
A. S. Brown,
O. H. Lincoln,
Jas. Cooper,
D. J. Willis,
T. A. Laird,
T. Henning,
J. W. Tillinghast,
W. H. Stanton,
W. O. Lewis,
James Farrell,
Geo. W. Moore,
G. W. Bullock,
J. R. Dowell,
E. McCarty,
R. M. J. Painter,
James McGovern,
Geo. McGovern,
W. S. Taylor,
Geo. B. Gaines,
Geo. R. Pace,
J. D. Alley,
Jacob P. Bogar,
E. J. Saville,
B. F. Ford,
C. H. Edwards,
Charles Berry,
S. M. Huntar,
Henry L. Barber,
C. E. McCluen,
William Cook,
A. W. Campbell,
W. C. Chapman,
S. A. Jessup,
F. P. Brown,
John E. Selden,
Wm. M. Pepper,
O. W. Chapin,
S. P. Peabody,
R. S. Raymond,
S. A. Jessup,
J. L. Edwards,
Mary E. Houseman,
W. H. Turner,
H. P. Dwight,
A. Hunter,
B. B. Toya,
Wm. Blanchard.
C. C. Crow,
C. O. Rowe,
J. W. Hay,
Noah Frissell,
Henrietta Diackman,
Carrie A. Hinds,
David McDonald,
W. R. Monroe,
J. White Kelly,
Will. O. Woodson,
G. H. Wadsworth,
C. W. Hills,
F. W. Flint,
C. A. Gaston,
Geo. Purdon,
Charles D. Camp,
Anne E. Brown,
R. C. Humphreys,
George W. Lee,
Colin Fox,
J. C. Sullivan,
L. B. Dwight,
Cornelius Corbett,
J. C. G. Hamley,
C. P. Mathews,
L. P. Crum,
Jas. A. Murray.
Wm. W. Cummings,
Albion Earl Lang,
Benj. Thompson,
Walter Miller,
James Miller,
B. S. Plumly,
William Roche,
P. H. Shaughness,
M. Collins,
G. A. Dodd,
Thos. M. Bryan,
Geo. D. Butler,
J. M. Nye,
H. B. Spencer,
James Lytle,
C. M. Clark,
J. A. Mantor,
E. G. T. Adams,
Wm. J. Evans,
C. Oscar Blake,
F. N. McMullen,
Alfred Saville,
A. H. Copeland,
D. S. Bailey,
E. H. Armstrong.
Ed. C. Armstrong.
F. A. Armstrong,
W. E. Kattles,
D. H. Ogden,
Emma Sammis,
J. B. Graham,
Albert J Jarvis,
Alfred S. Downar,
T. T. Onderdonk,
L. Waldorff,
C. A. Bolton,
A. W. Pearkes,
C. B. Munday,
Geo. W. Bell,
Geo. H. Godfrey,
P. J. Casey,
F. C. Ward,
J. L. Martin,
Wm. Spinnar,
C. Fred. Loomis,
H. W. Wynkoop,
C. C. Haskins,
W. T. King,
E. R. Brundage,
Joseph A. Remley,
G. A. Brown,
Elisha Ridar,
Phil. Bruner,
William Monaghan,
Benjamin Stevens,
Sam. Porter,
Thomas J. Tobin,
John F. Williams,
Eunice M. Baker,
A. G. Bates,
Alfred Wellar,
Smith Robertson,
O. S. Wood,
D. H. Henshaw,
Richard Waterman,
Geo. G. Hadley,
H. E. Doolittle,
J. U. Ansley,
John K. Calvert,
Charles D. Smith,
C. E. Moody,
Wm. N. White,
Josiah A. Hard,
O. A. Horne,
Chas. W. Moore,
Chas. L. Deforest,
Henry C. Beckwith,
E. D. Sanford,
A. G. Martin,
J. M. Worden,
John Wenzel,
Wm Sandford,
Thos. H. O'Reilly,
John P. Kirchner,
M. F. Seymour,
Chas. Selden, Jr.,
Wm. Stoneback,
C. H Summers,
Charles L. Snyder,
John W. Smith,
W. W. Smith,
Joseph W. Sherwood,
Samuel C. Taylor,
D. W. Warner,
Geo. T. Williams,
Wm. J. Lawler,
C. S. Lamb,
M. C Newman,
O. K. Newton,
Chas. E. Higdon,
A. Kern,
P. Callahan,
J. C. Mattoon,
A. H. Graham,
M. B. Graham,
B. F. Bush,
Edwin C. Bush,
Thos. Johnson,
T. J. Landy,
Clarence A. Bolton.
H. H. Henry,
C. A. Smith,
W. K. Applebaugh,
A. W. Haygood,
W. H. Chivvis,
W. P. Janes,
M. Foley,
Geo. K. Walcott,
George W. Alley.

—* Credited improperly on No. 9 on which they were not assessable.

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The number of guests invited by the Viceroy of Egypt to the opening of the Suez Canal amounted to twenty-eight thousand, of whom three thousand were Europeans and the rest Orientals.

Read this and do Better.

The Secretary of the Insurance Association frequently receives remittances from members who neglect to attach their names. This causes great trouble and expense. One letter received October 15th, bears post-mark "Louisville and Nashville R. R.," with a dollar enclosed, but no name. November 26th, a similar letter came with same mark. Who are you?

Another thing. When you change your address advise the Secretary of it. He has no time to hunt you up. Defaulters requiring more than one notice should send two stamps to pay costs. Now please attend to these things, *and be careful of your health.*

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Appreciation.

E. O. Wait, Esq., Superintendent of Telegraph for the Western Union Railroad Company, has so won the confidence of the executive officers that he is authorized to distribute cars and direct movements of trains upon the road.

◆

Obituary.

William A. Chapin, for several years foreman of the Western Union Telegraph Machine Shop at White River Junction, Vt., died of lung fever on the 25th of November, aged 46 years. Mr. C. was a man of unexceptionable character and held in high esteem by all who knew him. As a machinist he scarcely had a superior. He leaves a wife and two children.

◆

A New Theory of the Aurora Borealis.

Dr. A. W. Hall read a paper before the Polytechnic Branch of the American Institute, at the Cooper Institute, on the cause of auroral lights, in which he took issue with Professor Loomis and other scientists who attribute these phenomena to electrical action. Dr. Hall's theory is that the boreal display is produced by the rays of the sun which are reflected from clouds surrounding the pole to the ice and snow of the Arctic regions, and thence again reflected to the clouds, and so back and forth, until it comes within our range of vision. The glancing and flashing of the columns of light, he holds, are caused by the motion of the clouds, an exact correspondence being traceable, the doctor contends, between the movements of the light and those of the clouds. In confirmation of his theory the speaker cited the cases of similar displays of auroral light in the east just before sunrise, and in the west just after sunset, when there are banks of clouds visible from which the sun's rays are evidently reflected. The arches or bows often seen in the north are also easily explained according to this hypothesis, while by the electrical theory they are inexplicable. The deflection of the needle and other magnetic effects, sometimes observed during an auroral display, are attributed by Dr. Hall to the fact that the state of the atmosphere most favorable for these successive reflections of sunlight from the pole, is also favorable for the action of the electrical forces which produces the magnetic disturbances.

◆

An artist in Indianapolis, Ind., has in his studio a very fine Madonna which he takes pride in showing to his visitors. Imagine his feelings when, the other day, a lady who had examined the various pictures upon the walls, pointing to the Madonna, said: "But the one I like best is that *tired nurse girl*. Don't she look natural!"

Telegraphers' Mutual Insurance Association.

TREASURER'S REPORT.

During the past year the association has nearly doubled its membership. At your last annual meeting the number of members recorded was 349. The recorded number is now 652. The applications have come from States chiefly West and South. What are known as the New England States have not more than 25 members in the association. New York, Ohio, Indiana, Illinois, Tennessee, Georgia, Alabama, Virginia, are well represented. The cities of Troy, Albany, Syracuse, Buffalo, Cincinnati, Detroit, Nashville, Memphis, New Orleans, Richmond, Mobile, New Haven, Hartford, have almost every manager's and operator's name enrolled. New York city is largely represented also.

Most of the members are reliable and send their assessments cheerfully and promptly, yet some cause needless expense by requiring repeated notices, which, on account of repeated postages, eat into the funds provided for expenses by the initiatory fee.

Since the organization of the association there have been 10 deaths, an average of one per cent on the list of members. The first amount paid on account of death was $278. The last payment to the heirs of John Bohanna was $561. The whole payments to heirs up to October 1 was $3,305, and when the payment of assessment No. 9 is regarded complete, the amount will be nearly $4,000, a sum which has given great relief to the families of the dead, and shows how necessary and noble has been the association's work. There seems to be no reason to doubt a large increase of membership during the coming year.

During the past year 44 have proved defaulters, and their names, after waiting the result of a second assessment, have been erased. It is cheering to witness the promptness of many members who forward their money the instant a dispatch passes over the wires announcing a death. Some even pay in advance and deposit a sum to meet several coming assessments. If all would lay aside monthly fifty cents for the sacred work of this association, it is believed that it would prove a source of pleasure to all, an act of good fellowship which would honor the profession, would meet all claims, and would become a great positive blessing both to the giver and the given. The good already done must have proved recompense enough to all who have joined the association.

The amount on hand for expenses is $126.04, showing the expenses for the two years past to be $102.

The expenses of postage and stationery connected with a single death it seems might be properly charged against the assessment which it occasions, thus reducing the amount paid to heirs about twenty dollars and avoiding forever the necessity of an assessment for expenses.

Amounts paid are as follows:

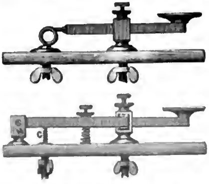
Heirs of Seba Christie	$274 00
Edwin A. Hall	346 00
John J. Winne	326 00
J. S. Vandusen	370 00
J. F. Stevens	346 00
James A. Allan	346 00
W. W. Shipman	347 00
C. J. Gaines	490 00
J. Bohanna	561 00
Total	$3,305 00

Add to this the amount now on hand for heirs of W. A. Cody, $540; $100 to settle an irregular claim, and $66 to the Anderson fund, the benefactions of the two years will amount to $4,000 provided for families, who, without such a provision, must have been exposed to suffering and want. It is a record highly honorable to all concerned.

J. D. Reid, Treasurer.

THE

Self-Closing Telegraph Key.



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A perfect self-closer. The circuit will always be kept closed when the operator ceases to use the key, and without manipulating any of the parts whatever, the key automatically closing when released from the pressure of the hand, additional parts for closing circuit being entirely dispensed with.

By changing the points of the Receiving Magnet, the Local Batteries are kept from action except when in actual use, and the sounder read in the usual manner.

The spring keeps the lever elevated above the insulated part, and in contact with the platina point inserted in the screw, the circuit being closed when the platina point is in contact with the platina plate on the lever, and broken when the lever is pressed down. C, conductor; N, negative. Key is insulated on both sides of the lever and under part.

Other designs on the same principle. For rapid transmission of the Morse and similar characters, unexcelled.

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"The only really practical and complete mode of securing the closing of keys is the plan of Mr. Jos. J. B. Frey. It is perfect of its kind, sure and economic. It proposes simply to reverse the adjusting screws of the magnet, placing the platinum point at the back, and reversing also the anvil of the key, making it above, instead of below the arm of the key, and closing the circuit with the back stroke. The manipulation of the key, therefore, in transmission, will be on an *open circuit*, the opening of the key by the usual mode of closing it connecting the local circuit. Thus when the key is not in use, it returns, by the ordinary spring, to contact with the screw now used to adjust the space of the key's play, but which by this arrangement has become the anvil on which the circuit is closed. The closing of the key is thus not only assured, but every local battery is allowed to rest when the key is closed. In this arrangement there is not only certainty but great economy.

The system is now in daily operation in South America where it has replaced with advantage the North American system, and works to perfection.

It offers the obvious advantages of security and economy in local power, as one half is saved by this arrangement."—Journal of the Telegraph, Nov. 15th, 1869.

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New Superintendent of the French Cable.

The former Director of the Swiss Telegraph system, and present Director of the International Telegraph Office at Berne, will assume January 1, 1870, the management of the French-American Cable Company, at a salary of 40,000 francs.—*Staats Zeitung, Chicago.*

◆

Exchanges by Telegraph.

In France, at the present time, the money exchange is done by means of the telegraph. The maximum amount of an exchange is 5,000 francs. The message which advises of the order retains the price of an ordinary dispatch. The rate charged is two per cent., the same as charged sending money by mail.—*Illinois Staats Zeitung, November 16.*

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I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and the payment of dues.

XI. A meeting for the election of officers shall be held annually during the first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written request of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

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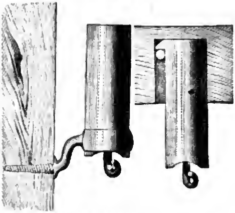

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JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 2. NEW YORK, DECEMBER 15, 1869. WHOLE NO. 51.

THE ELECTRO-MAGNETIC MODE.

[From Prof. Morse's Official Report.]

After alluding to his own early experiments in the use of the electro-chemical process, and his dissatisfaction therewith, Prof. Morse says:

Perceiving that by the electro-magnet he had command of a power capable at will to make a line of any length upon a moving strip or ribbon of paper, the inventor found that the dots and spaces and eventually the dashes of the code he had already devised, were readily made by any convenient marking instrument, such as a pencil or pen or printing wheel. The object, then, of the inventor, was to adopt the best of the several devices which had suggested themselves to him.

The first and most obvious was that of a pencil at one extremity of the lever, as in Fig. 18.

The marking with the pencil B gave a successful result, but the blow in striking the paper often broke the point of the pencil and required constant attention, and produced many interruptions, so that the use in the manner seen in the diagram was early abandoned, but the pencil was immediately used in the manner shown in the first constructed instrument of 1835, as seen in Fig. 18, (?) by which the damage to the point of the pencil was avoided, yet still the constant wearing away of the pencil presented a difficulty to be removed.

This was attempted by the use of fountain pens of various construction; at first a single pen formed a capillary tube, which had the inconvenience of not giving out its ink if out of action for any length of time. To remedy this defect the form of the fountain pen was like that shown in Fig. 19.

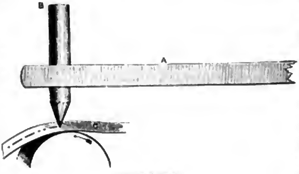
THE TRIPLE PEN.

This gave the dispatch by a three-fold line, so that in case one pen should be clogged and fail to record, one or both of the other pens secured the record. This method for sometime produced good results. It was the mode exhibited to the Congress at Washington in the session of 1837 38, and to the Academy of Sciences in Paris in 1838, described by M. Arago from its appearance as "*un petit rateau*," or little rake.

THE PRINTING WHEEL.

There was also another mode successfully used in the early experiments, seen in Fig. 20, by a printing wheel, as in the modern ink writers, the only difference between this original mode and the present ink writers being the supply of ink to the wheel originally by a sponge instead of the modern felt wheel. All these modes are distinctly specified in Morse's caveat of 1837, in the Patent Office at Washington. Why was not the last mode, so identical with the modern ink writers, which are so popular, at once adopted in practice? The inventor was desirous of avoiding several inconveniences attendant on all the modes of using ink. The drying of the ink upon the ink wheel, especially in dry climates and in warm weather, would often render the inking process unreliable. Again, unless care were specially taken, there was constant danger of an overcharge of ink, soiling the paper and producing grave interruptions.

Fig. 18.

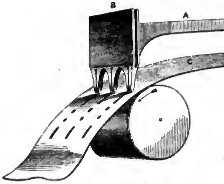


The Pencil Point.

THE STEEL POINT.

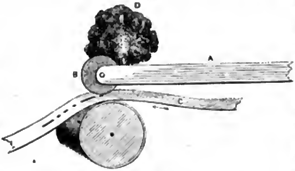
To avoid these inconveniences a steel point (*point sèche*) was devised and used, which marked the paper strip, by the interposition of a blackened or colored paper between the point and the paper strip, as in the ordinary manifold copying process. This also was successful, but did not remove every inconvenience.

Fig. 19.



The Triple Pen.

Fig. 20.



The Printing Wheel.

It was then that the idea of embossing the paper directly with the same stylus, in the mode now known as the dry point or embosser (the *point sèche*), was conceived and adopted.

This was considered by him a substantial improvement, since the simple stylus at the extremity of the lever was always in order, requiring no attention. It dispensed with ink and all its inconveniences and complication, and reduced the apparatus to its minimum of simplicity.

MODES OF MARKING OR RECORDING.

It is customary, in treating of this part of the telegraphic apparatus, by many historians of the telegraph, to consider this steel point or embossing mode as the primary mode devised by the inventor, and the inking or printing wheel as a modern improvement upon it by others. This is a mistake. The inventor considered the dry point or embosser as an improvement on his original inking apparatus devised and used as early as 1845, and was patented in April, 1846, and in the employment of his inking wheel by modern mechanicians, he thinks that some of the advantages of the dry point have been overlooked, while some of its disadvantages have been unduly exaggerated. These latter are stated to be—first, the disadvantage of being obliged to read the letters by a particular light and shadow fatiguing to the eye. A simple remedy to this is the application of a light ink roller to the top of the embossed letter as it issues from the stylus, in such a way that the ink touches the top only of the raised letter. This has been successfully done, and is a mechanical arrangement easily made, and it obviates this disadvantage, and at the same time obviates the second disadvantage, which is, that an embossed message, when the paper is rolled up, loses its raised character, and leaves the paper blank, so that the record is obliterated. If inked in the way just suggested this difficulty disappears. The third disadvantage is, that it requires a relay in order to furnish the requisite power to emboss the characters. This is the most plausible of all, and so far as it is desirable to dispense with the relay, the mode of inking the characters devised by the Messrs. Digney frères, to wit: by bringing the paper up in contact with the ink wheel, instead of the ink wheel down upon the paper, as in the original mode, is a successful and valuable improvement. It must be said, however, on the other side, that the dispensing with the relay, is, under some aspects, of doubtful economy, especially in view of the acoustic effect of the pen lever in the act of embossing; the effect is destroyed in the silent operation of the inking process, but with the relay and steel point is retained, and is of so important a character as to have modified to a considerable extent the whole process of telegraphic or rather semaphoric communication by the Morse apparatus.

To offset these disadvantages charged against the dry point there is one manifest advantage in its employment which seems so obvious that it is a matter of some surprise that no one of the ingenious mechanicians, who have been intent on improvements, should not have long since discovered and applied it. This advantage is the special applicability of the dry point process to automatic transmission.

◆

The Propagation of the Electric Current.

Mr. Pope seems to be unable to comprehend the difference between the illustration of an hypothesis and the demonstration of a fact, or that the demonstration of one fact does not necessarily prove another—distinctions which it seems to me ought to be obvious to every one. A man, for example, might demonstrate mathematically how many chicken pies he could make out of a certain number of goslings on the assumption that young geese were chickens, but this would not establish the fact of the identity between the two species of fowls. Mr. Pope may demonstrate with mathematical precision that an ocean cable can be worked with a single key, as he has represented that the Atlantic lines are, but this does not prove that this is the system employed. On the contrary, every intelligent telegraphist knows that neither of the Atlantic cables is worked in this manner. Mr. Pope may demonstrate with mathematical exactitude the distribution of the electric force upon a telegraph wire, but this would not prove that the electric current is due to a difference in tension between the two poles of the battery. We may call one of the two electricities + and the other —, and by uniting the two, obtain the zero of electricity, a result which can only be translated mathematically by giving the + to the quantity representing one of the electricites and the sign — to an equal quantity representing the other, but this result has no bearing upon the question of the propagation of the current. It simply shows that by the union of two principles a certain result is produced, which as De la Rive says in the passage quoted by Mr. Pope, "is completely independent of the ideas that may be formed of the nature of electricity, for it rests, not upon a single hypothesis, but upon experimental law;" and yet Mr. Pope regards this as evidence in support of his position, stating that he has simply translated this result mathematically. In order to comprehend the matter fully, let us see what he claims and what he proves. Mr. Pope asserts that "the current used in operating a telegraph wire is caused by the difference in tension between the poles of the battery employed." What he mathematically demonstrated is the manner in which the electric force is distributed in the wire.

The difference, therefore, between what he asserts and what he proves is as great as that between cause and effect. In other words what he demonstrates is entirely a separate and distinct matter from the subject under discussion.

The question at issue between us in regard to the propagation of the electric current is simply this. Is it caused by a difference in tension between the poles of the battery—that is to say, by a force analogous to the reactive force of a strained or twisted wire or distended rubber cord, or is it due to the neutralization or continued reunion of the two electricities. Mr. Pope asserts that it is caused by the former. I incline to the belief that it is due to the latter. The mathematical demonstration would show the same results, and the current would flow in the same manner, whichever opinion is held—or even if no opinion whatever is held in regard to the propagation of the current.

Mr. Pope says "the only assumption he has made is that the two poles of a battery are in opposite electrical states. If Mr. Prescott will not admit this, it is a waste of time to argue the question further." As this fact is as indisputable as the multiplication table, and has never been denied by me nor any one else that I ever heard of, I can't perceive the relevancy of its use in this discussion.

Mr. Pope denies that he bases his opinions of the propagation of electricity upon the Franklinian theory of a single fluid; but Mr. Clark, whom he quotes as authority for his assertion that the current is due to a difference in tension, adopts this view, as he personally informed me last summer; and this theory is in accordance with what he says on the subject in his work on Electrical Measurement.

"*I would advise the student of electricity to dismiss from his mind all ideas about the existence of two different kinds of electricity, and to regard the earth as a vast reservoir highly charged with one kind of electricity (positive), and to regard a telegraph or a battery as an arrangement by which electricity is pumped out of the earth at one point and poured into it at another.* When any object has less electricity than the neighboring earth, it is charged *negatively*. When it has more it is charged *positively*, and in either case electricity will endeavor to flow from the earth to it, or from it to the earth, until equilibrium is established."

De la Rive's writings are not so old by a decade as Mr. Pope asserts, but even if they were, it must be allowed, as the fellow out West said about Shakespere, they contain some pretty things! Consistency is said to be a jewel; but if so, I am afraid Mr. Pope will scarcely be able to secure it by objecting to De la Rive's writings on account of their age, while he refers authoritatively to those of Ohm written over thirty years before! When I have more leisure I will get Mr. Pope to expound those laws of Ohm, which I "not only do not understand but have never seen," and will also get him to point out the passage in Ohm's "eighty pages of closely printed matter," wherein he says "the electric current is caused by a difference in tension between the two poles of the battery," and the other more remarkable law that "the difference between three nothings constitutes a dynamic force."

I desire to say one brief word in regard to Mr. Pope's mutilation of Mr. Webb's mathematical formula in the October number of the JOURNAL. The formula, as written by Mr. Webb, may be stated thus: The tension at any given point on a wire equals the tension of the whole wire when electrified by a source without resistance, less the difference between the strength of current and the sum of the electro-motive forces included in the line between the given point and the origin of the abscissa.

In reproducing the formula, Mr. Pope omits the letter which represents the tension of an insulated circuit electrified by a source without resistance, and thus leaves his imaginary line in a worse plight than it was in the former article, for then it was only required to work upon a current due to a difference in tension, when the tension was at zero at both ends and in the middle; while now he proposes to work the line not only without any battery, but with a diminution of what it has not got. As modified by Mr. Pope, the proposition reads thus:

The tension at any given point on a line equals the strength of current included in the line between the given point and the origin of the abscissa, less the sum of the electro-motive forces included between the same points. Now as the strength of current is always necessarily less than the sum of the electro-motive forces, and as no other source of electricity is given in the sum of the electro-motive forces, and as no other source of electricity is given in the modified formula except that between the given point and the origin of the abscissa, it follows as a corollary, that the tension at any point on the wire must be as much less than nothing as the strength of current is less than the sum of the electro-motive forces.

Mr. Pope says in regard to my diagram showing a wire connected from the center of a line to the earth, that "according to his views there would be no current in the wire;" but I fancy if he were working a wire between New York and Boston, for example, and Hartford were to put on a ground wire, he would find there was "something the matter" about that time, and it would not take him very long to arrive at the unpleasant conclusion that both his theory and current had been practically run into the ground! It isn't the easiest task in the world to comprehend by what system of false reasoning a practical telegraph operator can be made to believe that a ground wire can be attached to the middle of a telegraph line and yet contain no current. This difficulty, however, is rather increased by his attempted explanation that "*an instrument inserted between the battery and the ground is included in the circuit, while one placed in the center of the line is not included in it.*" I wonder if it never occurred to Mr. Pope that if he should *run a wire from the middle of the line to the ground, that he would divide his line thereby into two circuits*, and that the ground wire in the middle would serve as a conductor for both in precisely the same manner as the ground wires at the terminal stations. If it never did I would advise him to try the experiment, and demonstrate the truth of it by opening alternately either of the two circuits formed by such wire, when he will find that the current upon the other will work the relay or galvanometer placed in the middle of the ground wire.

I hope these plain illustrations will remove some of Mr. Pope's erroneous theoretical notions, but whether they do or do not, I trust that no operator upon the Western Union lines will be induced by his "demonstrations" to believe that he can put on a ground wire without disturbing the current, or that the difference between three nothings can create a dynamic force.

George B. Prescott.

◆

Magnetized Watch Springs.

It has recently been discovered that the springs of chronometers and watches, which are constructed of steel, are frequently magnetic. Steel is at all times liable to become magnetized from causes beyond man's control. Watchmakers are advised to test their springs as to magnetism by placing them near to a very small and truly-balanced mariner's compass. If the spring exhibits in none of its circumference any tendency to move to one pole of the compass more than the other, it may be considered free from magnetic influence; on the other hand, if the North pole moves to one part and the South pole to the other, the spring is decidedly useless; for in whatever position the timekeeper may be placed with such a spring, it will be affected by the earth's magnetism.

◆

A Postal Convenience.

A novelty, as well as a decided convenience, has been introduced into the postal arrangements in Austria. Cards of a fixed size are sold at all the post offices for two kreutzers, one side being for the address and the other for the note, which may be written either with ink or with any kind of pencil. It is thrown into the box and delivered without envelopes. The object is to enable persons to send off with the least possible trouble messages of small importance, without recourse to paper, pens, ink and envelopes.

◆

A TELEGRAPHIC art association has been formed in England to watch the course of government in reference to the introduction of inventions deemed valuable in promoting telegraphic efficiency. This indicates a fear that under government control invention will be checked.

A Description of the Leclouche Battery.

Translated from the Notice Sur la Pile Leclouche.

BY GEORGE B. PRESCOTT.

The principal chemical action in a battery is the dissolution of a metal. This dissolution can be considered as a combustion, having for result the transmission of a certain particular vibratory movement, called electric, and of which the effects must be proportional to the intensity of the forces at work, that is to say, to the affinity of the bodies present in all battery elements wherein zinc forms a part, this body becomes negative and the liquid positive. To collect without loss the amount of electricity produced by the zinc and the liquid is the result to be obtained ; or in other words the interior chemical action must be in perfect equivalence with the exterior work, chemical or mechanical, effected by the apparatus independent of time.

In order that a battery element obtain this equivalence it is necessary that the two bodies constituting it be found in the following conditions.

1st. The body designed to receive the negative electricity requires to be a good conductor of electricity and to possess a great affinity for oxygen, when the electrical equilibrium is broken ; in short, it requires to be able to render the product of oxydization easily soluble.

2d. The body receiving the positive electricity on the contrary, requires to be inoxydable, but it requires to be an equally good conductor, and to have such an affinity for hydrogen that it tends to suppress this essentially perturbating body immediately on its formation.

The properties required by the first of these two bodies are developed to a high degree in zinc and iron, therefore it is not necessary to replace these metals by any other substance. With respect to the second, we have not employed, up to the present time, any matter reuniting all the valuable conditions, the metals being unprovided with affinity for the liberated hydrogen. In order to obviate this inconvenience, we have surrounded the positive plate with a variety of substances, such as sulphate of copper, lead, mercury, etc., all substances which having no proper conductibility in the solid state, can only act through their greater or less solubility. Becquerel, Marie, Davy and Daniell, have thus succeeded in constructing batteries constant in their effects, called at the present time *piles of two liquids*.

Leaving aside the details of construction, we will examine what is the real expense of this apparatus in the more common application to industry, which can be divided into three classes.

In the first class I place the signals of all kinds, in a word, the electric bells in general :—one or two pennyweights of metal reduced to the voltameter, represents the effective work of this apparatus during a year.

In the second class are included all the telegraphic communications where the currents have always only a very feeble intensity, considering the very great resistance of the receiving magnets and conducting wires. In the secondary stations of the Companies and of the State, the consumption of the metal is from three to six pennyweights, and in the important or principal offices, of from six to twenty-four pennyweights.

Finally the third class comprehends its application to clock works, electro-motives, and galvano-plastics, where the expense is always considerable and sometimes reaches two pounds and even more.

All this shows that the battery which applies with the best advantage to the two first classes, which represent at the present nine-tenths of the batteries in use, will be cells which furnish the least interior chemical action, all of them being a great electromotive force, and it being of little importance whether they give more or less electricity in a unit of time.

For the third class, on the contrary, the interior action may always be neglected, owing to the enormous work which this apparatus is able to perform, provided that the quantity of electricity furnished in a unit of time is considerable. Daniell's and Bunsen's batteries, in this case, leave absolutely nothing to be desired.

By that, we see that the work of a battery varies according to its mode of application, the same element giving good or bad results according to the employment to which we subject it. A Daniell's battery, which consumes twelve or fifteen pounds of sulphate of copper per annum, does not generally utilize, in telegraphy, more than a half a pound, and gives consequently, only a produce of seven to ten in one hundred. If we add to this the necessity of cleaning the batteries every two or three months, and of inspecting the apparatus, which can not be abandoned to themselves for more than three or four days, we easily comprehend why this system was unsatisfactory. We conceived then of substituting for the sulphate of copper the sulphate of oxydule of mercury, a relatively insoluble salt, which reduces a trifle the care of inspection ; but the maintenance of this system is only economical as far as the residue of mercury is vigorously gathered : a work which we know to be difficult to obtain on the part of employes.

Besides with this system, we are very far from the theoretical produce, because, in spite of the small solubility of the sulphate of mercury, this solubility is still sufficiently considerable, for the produce is but thirty to forty in one hundred in the average telegraph offices, and of five in one hundred at the most in electric bell work.

In short, when a telegraph office is supplied with the piles of Marie-Davy, it has only the advantage of requiring less inspection, for if the produce of the Marie-Davy elements is seven or eight times greater than the produce of Daniell's elements, the net cost of the sulphate of oxydule of mercury is nearly six times as much. With regard to the duration of the elements they last but little more than six months to a year, and it is to be remarked that this duration is always the same, whatever may be the importance of the office.

It is after having seen how the expenses were small in the majority of practical applications of electric piles, that I have found the solution of the following problem : *To obtain a theoretical pile in which the chemical action, being always in perfect equivalence with the effectual work, necessarily would leave a duration proportional to this work, without the least supervision.*

This solution, of a great interest in telegraphy, I hope to have in the use of peroxyde of manganese, in presence of ammoniacal salts, in the electric piles.

The peroxyde of manganese, possessing a suitable conductibility, analogous to that of metals, lead me to think that it would be possible to construct a constant pile of a single liquid, by employing a plate of this material as a positive element. The chemical composition of the peroxyde of manganese indicates, in effect, that it ought to combine all the conditions announced previously, namely : inoxydability, insolubility and great affinity for the combustible bodies.

For a negative plate, I have chosen zinc, because this metal possesses all the qualities theoretically required. With regard to the liquid bathing the two poles, as it is not necessary to use acids or salts for decomposing one of these two bodies, it could employ, therefore, the salts of alkaline metals that might be completely inoffensive.

(To be Continued.)

An Unfortunate Inventor.

RICHVIEW, Nov. 30

EDITOR JOURNAL OF THE TELEGRAPH:

Dear Sir: I was much interested with the article in the second November number of your paper, entitled "A Very Strange Story."

It is very often the case that "truth is stranger than fiction," and I think, too, that the results obtained in the case mentioned are but a faint foreshadowing of what will, in the future, be accomplished by means of that wonderful agent, electricity.

Unfortunately it sometimes happens that just as some important discovery is about to be made known the inventor is removed from our midst by some cause, and the discovery is, for the time at least, lost to the public.

A case of this kind, I am very credibly informed, happened a few weeks ago at a small town three or four miles from this place.

A certain person, unknown to fame, but a zealous and attentive student of the natural sciences, some years since conceived the idea that electro-magnetism might be used as a motive power in the mechanical arts to a much greater extent than at present, and he spent much time trying to invent some machine in accordance with this idea.

At last his labors resulted in an apparatus which had for its object the moving of heavy weights and loads for short distances without the aid of horse or steam power.

The machine was placed upon the track of a new railroad just completed to that place, and about two hundred feet from a car heavily loaded with iron.

The inventor, after making a few preliminary arrangements, gave one or two turns to a small crank connected with the apparatus, which, by some means, seemed to develop its powers.

The result of the experiment was only too successful. For, instead of the car being attracted and drawn to the machine, as was expected, the machine itself was drawn toward the car, with such fearful velocity that it was completely demolished.

[It also involved in its own destruction, not only that of the car, but also of the whole track of the railroad between itself and the car which was torn up by the machine as it moved along, and involved with it in a common fate.]

Whether from excessive joy at the success of his experiment, or grief at the destruction of his machine, I can not say, but since then the inventor has been confined in the State asylum for the insane.

The above facts can be vouched for by good authority. Yours very respectfully,

R. W.

◆

A Cable Telegraph to America.

LISBON, Dec. 3, 1869.

The Portugese Government has invited tenders for the manufacture and laying of a submarine telegraph cable from Portugal to some eligible point on the American coast, touching at the Azores.

◆

ELECTRICITY DEVELOPED BY THE DISSOLVING OF SALTS IN WATER.—M. Raoult.—The author says the dissolution of a salt in water is a complex phenomenon whereby we distinguish—1st, the fusion (melting), or disintegration of the salt, whereby heat is absorbed ; 2d, the diffusion of saline molecules in water, which also absorbs heat ; 3d, the combination of the salt with water, whereby heat is set free. The author then states that the conditions alluded to under Nos. 1 and 2 do not produce any electricity, but that, on the other hand, the combination of a salt with water certainly does give rise to an electric current, to prove which the author records a series of experimental results.

International Telegraph Communication.

(*From the President's Message*).

OCEAN CABLES.

It having come to my knowledge that a corporate company, organized under British laws, proposed to land upon the shores of the United States and to operate there a submarine cable, under a concession from His Majesty the Emperor of the French, of an exclusive right for twenty years of telegraphic communication between the shores of France and the United States, with the very objectionable feature of subjecting all messages conveyed thereby to the scrutiny and control of the French Government, I caused the French and British Legations at Washington to be made acquainted with the probable policy of Congress on the subject, as foreshadowed by the bill which passed the Senate in March last. This drew from the representatives of the company an agreement to accept as a basis of their operations the provisions of that bill, or of such other enactment on the subject as might be passed during the approaching session of Congress; also to use their influence to secure from the French Government a modification of their concession, so as to permit the landing of any cable belonging to any company incorporated by the authority of the United States or of any State of the Union, and on their part not to oppose the establishment of any such cable. In consideration of this agreement I directed the withdrawal of all opposition by the United States authorities to the landing of the cable, and to the working of it until the meeting of Congress. I regret to say that there has been no modification made in the company's concession, nor so far as I can learn have they attempted to secure one. Their concession excludes the capital and the citizens of the United States from competition upon the shores of France. I recommend legislation to protect the rights of citizens of the United States as well as the dignity and sovereignty of the nation against such an assumption. I shall also endeavor to secure by negotiation an abandonment of the principle of monopolies in ocean telegraph cables. Copies of the correspondence is herewith furnished.

◆

Senate.

The President has sent to the Senate a message inclosing the correspondence relative to ocean cables, from Minister Washburne, dated Paris, Oct. 5. He informs Secretary Fish that the French Government receives favorably the proposition to conclude a telegraphic convention between France and the United States. On the 23d of November Secretary Fish transmitted to all our Ministers abroad a letter, in which he says the President desires to conclude a convention on the basis of security of cable lines, in times of peace or war, against willful or wanton destruction or injury, by declaring that such acts shall be deemed acts of piracy, and so punished; also, suitable provisions to encourage the future construction of ocean lines, and that hereafter no exclusive concessions shall be made without the joint action of the two Governments whose shores are to be connected. The scrutiny of messages by Government officials in favor of the Power controlling either end of the cable is, in the opinion of the President, calculated to lead to trouble; therefore he proposes to have provision against it.

The President desires that the representatives at Washington of Great Britain, France, Portugal, Spain, Italy, North Germany, Austria, Russia, Belgium, Holland, Sweden and Norway, Denmark, Turkey, Greece, Venezuela, Brazil, Argentine Confederation, Columbia, Bolivia, Peru, Ecuador, Mexico and Chili may be empowered to enter jointly and severally into negotiations with the United States and each other, with a view of concluding a joint convention for the purpose of establishing cable lines between the United States and those countries. It will be understood, however, that this subject is submitted simply as a basis for future discussion, should the leading Powers concur with the United States in considering the subject one for international consideration and jurisdiction.

◆

Postal Telegraphs.

THE NEW POSTAL TELEGRAPH SYSTEM OF GREAT BRITAIN—A NUMERICAL CODE TO SUPERSEDE THE SPELLING AND WRITING PLAN.

[From the Irish (Dublin) Times, Nov. 24.]

The army and navy telegraphic code has recently received the Postmaster General's sanction for public use over the government telegraphs so soon as they are transferred to the Post Office Department. Unquestionably this is one of the most important reforms which could possibly take place in the system of telegraphic communication. The greatest grievance in connection with the telegraphs, and one which the public has borne in silence for years, is the publicity of telegraphic matter. The casual sender and receiver of telegrams can hardly realize the amount of "mutilation" and "tampering" an important message undergoes during its transmission. During the evidence taken before the Committee on Telegraphic Communication a Mr. Green said:—"On the 20th of June we telegraphed them, 'Buy linseed for 56s.; rapeseed and poppyseed, 53s.; saltpetre declining.' They telegraphed, 'Buy linseed for 52s.,' leaving out rapeseed and poppyseed altogether, and putting in saltpetre advancing.'"

The code system, as sanctioned by Lord Hartington, and now used in both our services, consists in the transmission by means of a numerical code, instead of by the ordinary Morse spelling process. By means of this code, which is based upon a combination of symbols, consisting of dots and dashes, words or phrases are represented by groups of numerical symbols, never exceeding five. This code, which has been drawn up by Major F. Bolton, represents particular words and phrases by definite combination of their numerals, in addition to which there are symbols for expressing decimals, fractions, stops, italics, and inverted commas, &c. There is also a spelling process for rendering proper names or uncommon words. The code book is the key or dictionary of the language, and its arrangement is one of the most valuable and ingenious features of the system. The pages are numbered in consecutive order, and also the lines of each page, and when it is desired to send a message all that is necessary is to transmit the number, or numbers, referring to the page and line in the code where is to be found the letter, word, or sentence which the correspondent is to be acquainted with. Now, if we require to send this message by the code, "Cotton is falling, and I should not advise you to buy," we search under the letter C for cotton, and this is found at page 030, and the exact sentence we wish for is numbered 7, so we write 0307, and in this sum the message is signalled, and reaches its destination, where it is "keyed," and the purport arrives unmutilated and beyond the chance of being tampered with. This is the boon to the public.

Let us see how the Post Office gains or loses by the use of the code. It would appear at the first sight that they are to be losers on all that business which is now known as "excessed," or, in other words, on those telegrams containing more than twenty words, now allowed by the different telegraph companies for certain priced messages. Granting this—that the Post Office would be losers on such traffic being transacted by the code system—let us inquire how much will be the gain on ordinary messages that are and must be under twenty words. The gain is simply this: That a message of twenty words can be transmitted by code in a group, or, at the most, of two groups of figures, containing never more than five figures each, or, in plain English, twenty words are signalled by means of ten figures. Now, it is a well known fact that the latter travel with twice the rapidity and safety that words can be transmitted over telegraph wires, and the fact is patent to every one that since five letters are the mean of words in the English language, a group of five figures should be accepted and charged for as a word, not only for this very important reason, but on account of the immense saving these groups effect for the Post Office, in time and labor of working the telegraphs.

The code comes into use immediately the official transfer of the telegraphs takes place.

◆

Telegraph Decision.

In Atlanta, Ga., November 17, the Superior Court rendered a decision in the case of Odell versus the Western Union Telegraph Company for sixteen dollars. The damages claimed were two thousand dollars for error in the transmission of a telegraphic message. The court and jury decided that telegraph companies are not considered common carriers; that they are not responsible for errors of atmospheric electricity over which they have no control; that the printed rules and regulations of the telegraph company are special contracts binding on parties who use the telegraph lines; that the damages awarded the plaintiff were actual expenses for the transmission of a message and express expense of a money package missent by error of the telegraph. The court also decided that telegraph companies are not responsible for errors, delays, &c., when their lines or territory are under the control and supervision of military authority.

◆

John Butterfield.

Verbal eulogies of men like John Butterfield would be idle. His eulogies are in the towns and cities to which his enterprise has given birth. The telegraph bears them in its swift messages, the express in its costly freights. Railroads in lasting memorials, commemorate his industry and his shrewdness. Two years ago, his departure from business circles left a vacancy more marked than would that of any other Utican. His long illness has prepared the community to expect his death. But no local record will be complete, no history of the growth of communication and facilities for trade and travel in our country will be full and trustworthy, which does not perpetuate the services rendered, the labors performed by John Butterfield.—*Utica Herald.*

◆

A FEW copies of Volumes I and II of the JOURNAL OF THE TELEGRAPH, neatly bound in cloth, with leather back, price $2.50, can be supplied.

◆

THE English Government have not found it necessary to resort to a loan for the purchase of the telegraph lines. How the money is provided we have not seen stated. The lines will be assumed in divisions, and it will require some months before all are in government hands.

War.

What are familiarly known as "opposition" telegraph lines have entered into a new but expected period. They were originated on the plea of a public necessity to curb and crush a "gigantic monopoly," as well as on ingeniously arranged proofs of the profits of the business. We need not say how all this has been done. The logic and the eloquence of telegraph contractors are well known. How deftly have we heard them divide the twenty-four hours into minutes, and show how a single wire could send 1,500 messages a day, equal, at 25 cents each, to $136,000 per annum; how this sum, by extension of lines, could be multiplied indefinitely; how small the expenses were; how vast were the profits of the monster line which was devouring the nation; what a magnificent chance for big dividends and doubled stocks! Oh, the music of that old, old song! And so the money came. Lines ware built on contracts, with gracious margins, like those which summer shows along the shores of shallow streams whose chief business it seems to be to make their margins fruitful and full of flowers. In process of time, offices opened their tempting doors over which the opposition signs flashed grandly. It was the "telegraph of the people." It was opposition to monopoly. And business came to them, as why should it not. Many people like competition, and it was given them. "Reduced rates" was an invitation which the American mind appreciates, and to which many of course responded. They were surprised to find, however, that the "grand monopoly" had meanwhile, without reference to opposing lines, graded a general tariff on a long considered and carefully matured plan, which was practically lower and more generally just than theirs. The plea of oppressive tariffs was thus broken. The monopoly had practically become the opposition. Simple competition was not what the opposition wanted. Business was not sought by its better execution, but by such a flaunting of reduced charges as would secure the public preference. So seeing this gun spiked, in process of time a new reduction was ordered, a reduction not demanded by any necessity save that of rivalry. Circulars were thrown into every marchant's office, and on every dry goods counter, bearing the enticing words "a still further reduction." They had a mournful look. It was like advertising "a glass of beer and a sandwich for five cents." The Western Union Company accepted the war and the weapons. With competition, fair and square, it would not have meddled. But when the knife was drawn, another knife had to come out. It was a guage of battle. It is now to be seen who carries the longest knife. We expect to hear some one say one of these cold days,

"Alas! a malady
Preys upon my heart which medicine cannot reach."

◆

TELEGRAPH WIRE INSULATOR.—W. D. Gnseman and E. C. Bright, Morgantown, Va.—This invention relates to a new and useful improvement in insulators for telegraph wires.

◆

THE *Phrenological Journal* is one of the handsomest monthlies which now enter our office. It is edited with taste and skill. Its change of form to royal octavo is a great improvement. Samuel R. Wells, 389 Broadway.

The Service—South.

APPOINTMENTS DURING OCTOBER.

G. H. Brown, Goldsboro', N. C.
W. H. Thweatt, Manassas, Va.
C. H. Rogers, cashier, Savannah, Ga.
G. W. Dunelle, Millen, Ga.
A. N. Oldfield, Atlanta, Ga.
W. R. Cathcart, Columbia, S. C.
S. W. Capers, Columbia, S. C.
E. Winter, Montgomery, Ala.
W. P. Baker, Selma, Ala.
J. W. Stephens, Atlanta, Ga.
S. T. Davidson, Atlanta, Ga.
R. O. Camp, Rome, Ga.
W. H. Adkins, Acworth, Ga.
W. F. Pledge, Water Valley, Miss.
C. H. Mixer, Vicksburg, Miss.
Geo. H. Addie, Magnolia, Miss.
M. Pepper, manager, Memphis, Tenn.
C. McCarthy, Memphis, Tenn.
Ch. R. Morris, Okolona Miss.
Frank Lay, Corinth, Miss.
Ward Parker, Gainesville, Ala.
T. P. Steger, Pocohontas, Tenn.
W. D. Evans, Burnsville, Miss.
J. L. Buchanan, West Point, Miss.
N. Evarts, Louisville, Ky.
G. E. Netherland, Louisville, Ky.
H. E. Grant, Louisville, Ky.
B. Hughes, Louisville, Ky.
Thos. Tyrrell, Nashville, Tenn.
J. E. Reeves, R. R. Supt., Louisville, Ky.
G. B. Hunt, Little Rock, Ark.
G. J. Rea, Shreveport, La.
C. Armstrong, Monroe, La.
John G. Sabine, Jefferson, Tex.
D. C. Bleakney, Galveston, Tex.
J. R. Williams, Houston, Tex.
P. Mularkey, Houston, Tex.
W. N. Manley, Lagrange, Tex.
M. C. Bagley, New Orleans, La.
C. Dwyer, New Orleans, La.
Henry Warren, New Orleans, La.
Henry Stansberry, New Orleans, La.
W. Cummings, New Orleans, La.
T. J. Fitzpatrick, New Orleans, La.
J. A. Smith, New Orleans, La.
G. A. Hogsett, New Orleans, La.
John W. C. Barnes, Marlboro', N. H.
L. E. Bathrick, Winchendon, Mass.

DISCHARGED IN SOUTHERN DISTRICT.

For intemperance	1
For neglect	1
For disobedience	1

TRANSFERRED.

Name.	*To.*	*From.*
N. R. Young, operator	Lynchburg, Va	Alleghany Springs.
E. Cashin, manager	Augusta, Ga.	Milledgeville.
W. Heynie, manager	Milledgeville, Ga.	Greensboro'.
B. T. Howard, operator	Charleston, S. C.	Knoxville, Tenn.
W. O. Duncan, operator	Knoxville, Tenn	Charleston, S. C.
T. J. Waite, operator	Greensboro', Tenn	Acworth, Ga.
T. Phillips, operator	Tuscaloosa, Ala.	Greensboro', Ga.
E. O. Eshelby, operator	Shelbyville, Tenn.	Wartrace, Tenn.
M. Raphael, manager	Galveston, Tex	Houston, Tex.
D. S. Ryan, manager	Waco, Mo.	Houston, Tex.
A. F. Work, operator	New Orleans	Brashear City.
Geo. M. Smiley, operator	Sterling Junc. Mass.	Grout's Cor., Mass.

LEFT THE SERVICE.

L. Stewart, Millen, Ga.
E. D. Estes, Water Valley, Miss.
F. W. Mitchell, Okolona, Miss.
D. A. Logan, Louisville, Ky.
Samuel Stevenson, Louisville, Ky.
—— Speer, Louisville, Ky.
W. L. Biggert, Louisville, Ky.
H. W. Butler, Winchendon, Mass.
H. T. Brown, Sterling Junction, Mass.
C. R. Richards, Grout's Corner, Mass.

◆

EDITOR JOURNAL OF THE TELEGRAPH:

Please tell us, through the JOURNAL, how many words are in the following paragraph:

To——
Your mother-in-law will reach home on Tuesday next.—A. C.

Answer.—Eight words.

◆

A. F. MERRIMAN, for the last two years express agent on one of the Sound steamers, is back to his old trade in charge of the telegraph station at Otisville, N. Y.

Did You Ever!

We have before us a message which, as a specimen of courageous literature and curtailing, exceeds any thing we have yet seen. The writer, it seems, was under the impression that messages were charged by the letter, and so the message was written thusly:

Patrick Flanigan, Chicago
let A M'Cusker No of yo wod Al yo Bo Dan go out to you in H.

Which, being interpreted, means:

Let A. M'Cusker know if you would allow your brother Dan go out to you in haste, &c.

And the following is like unto it, only much more so.

EDITOR JOURNAL OF THE TELEGRAPH:

The following is a correct copy of a message recently left at the San Francisco office:

Vai ju sent mie no guts I veit form.
Translation.—Why you send me no goods, I wait for them!

The following is a copy of a message left at Chicago office, addressed to Mr. ——:

Sant Josep Mishegan
El lost ahl mie mony sum Diefs tacket!
Translation.—I lost all my money some thief take it!

Yours Truly, A. S.

Don't you think receivers have a delightful time of it deciphering such messages, and many others written by men who wear kids but can't understand Webster?

◆

MRS. A. M. OGLE, reported as having left the service, says: "I stand firm to the old ship, and am in charge of the W. U. office at Johnstown, Pa., under Superintendent C. O. Rowe, Esq.

◆

ONE of the most amusing bulls occurred at the main office of the Western Union Company a short time since. A certain Boston operater was sending a report of the execution of a New Hampshire murderer to New York. The copy from which he was sending was evidently that of a chirographical disciple of Greeley's, as the sender every now and then spluttered and hesitated, and frequently complained of its illegibility. After making several ludicrous blunders, he capped the climax by sending the following:

"The doomed man then arose, partook of a hearty breakfast, and immediately afterwards went and *buried himself with his fife.*"

After careful study the receiver (notwithstanding the protestations of the Boston operator that he sent it as it was written) came to the conclusion the doubtful words would appear better by being translated he "*busied himself with his pipe.*"

◆

THE pneumatic, or forwarding of messages by air pressure through the new tube between the telegraph office and Board of Trade building, has proved a complete success at the first trial, which took place November 13. In consequence of this success the present machine used will be replaced by a new and larger one. The arrangement is a very simple one, and the time consumed in the passage through the tube was yesterday on an average three seconds, for each message, although many messages can be sent at one and the same time. It is not to be denied that this improvement is a necessary, desirable and noteworthy one, yet not so grand a thing, that the *Times* should go into ecstasies on account of it, and so declare that "Chicago has again proved by this pneumatic tube the undisputed fact, that it leads all other places in grand undertakings." Don't get quite so excited Mrs. *Times!* In London and Paris these grand undertakings have long since been made use of on a much grander scale. Even in the much slower Germany the pneumatic tube has long since found a home. Between 'Change and the telegraph office in Berlin messages are sent by means of air pressure at a distance of one and a half English miles, and, in London, an immense pneumatic tube expedites all express matter, and even persons were sent through it at its inauguration.—*Illinois Staats Zeitung.*

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, DECEMBER 15, 1869.

One of the Fruits of the War.

The touch of power is very fascinating. Man is by nature a tyrant. He delights in authority. His first attractive toy is a whip. He cracks it over the ears of a hundred imaginary ponies, and sometimes to the dismay of his own. He would be governor in the paternal mansion, and often is. By degrees he learns either by the parental strap or by the association with other boy tyrants, that the play of king won't do. The discovery is provoking, but real. So the little lungs become less fierce, and a wholesome remembrance of leather makes young Bob obedient, if not agreeable.

Our war was not without its evil results. They are passing away. We do not allude to its sufferings and tears. These are all too well known, and will soon also be forgotten. But the war gave to some men what raw meat gives to the caged lion—the taste of blood. The tyranny of opportunity, the imperialism of command, ministered to many a nature like the nectar of the gods. It was the whip restored. It made the blood tingle with unrepressed delight. It seemed grand by a word to rush ten thousand men into the jaws of death, and the taste of authority lingers on the lips too sweet to wipe away.

With the close of the war, the love of power, its fascination, to some extent remained. It found other channels, so usually unseen, as to seem lost. A day or two ago it blew its horn in Congress. A well-known general demanded the statistics of three of the great enterprises of the nation, with a view to their national control. He would have industry balled and chained. He would remove enterprise from the inevitable action of contemporaneous causes which adapt all things ultimately to public necessities and average compensations. He would give to Government work which it never yet has performed with the credit, or the vim or the skill of private energy.

With consummate irony Herbert Spencer says of like plans in Great Britain:

"Private enterprise has done much and done it well. Private enterprise has cleared, drained, and fertilized the country, and built the towns, has excavated mines, laid out roads, dug canals, built railways—has invented and brought to perfection ploughs, looms, steam engines, printing presses and machines innumerable—has built our ships, our vast manufactories, our docks—has established banks, insurance societies and the newspaper press, has covered the sea with lines of steam vessels, and both sea and land with telegraphs. Private enterprise has brought agriculture, manufactures and commerce to their present height, and is now developing them with increasing rapidity. *Therefore, do not trust private enterprise.*

"On the other hand the State so fulfils its protective function as to ruin many, delude others, and frighten away those who most need succor. Its national defences are so extravagantly and inefficiently administered as to call forth almost daily complaint and expostulation; and as the nation's steward it obtains from some of our vast public estates a minus revenue. *Therefore, trust the State.*"

We do not intend to apply this irony here. It is ungracious to speak ill of our government. But every word is true whenever the issue is made between private enterprise and governmental assumption of national industries. The one pushes to greatness, the other dwarfs, and bungles, and kills. Hence we repeat "hands off!" Let this nation sink or swim on its enterprise and skill, not fatten, and be killed by a public spoon. Let government look on while its citizens act. Let it forbid unfairness. Let it adjudicate when called upon. Let it enforce restitution for injuries. But let its proper work be first well done before it attempts new duties or assumes new responsibilities.

◆

Fast Writing.

One pernicious effect of the tests made a year or more ago, of the possible rapidity of transmission by the use of the Morse signals, has been to convey the idea that merit lay in rapidity of execution rather than in carefulness of manipulation. And so it happens now that young operators are more anxious to show how quick their fingers can move, than how neatly and symmetrically their signals are formed. This is very unfortunate, and which we desire to do all we can to correct. The publication of the tests referred to seemed necessary, because the tests were highly meritorious and valuable, The manuscript of the messages sent under them are rare specimens of correct and clear chirography, which have excited the admiration of European experts, and is a subject of just pride to our own. The manuscripts proved the precision of the manipulation of those who transmitted them. It was an exceptional service for a distinct purpose, and was the result of long experience and careful training.

An operator's first business is to write correctly. Nothing should tempt him to sacrifice precision to speed. It is alike dangerous and pernicious. Some write as if they were scratching their key, instead of the painstaking manipulation which inspires confidence in the receiver that he is penning an actual message. The a's are all i's; the u's are all s's; the c's, and r's, and e's, and u's, and d's are almost all alike, and the sweat breaks on the brow of an honest receiver as he tries to make sense out of a message which sounds as if scratched out by some very hungry hen. It is a great mistake and a great misfortune. We advise all young operators to a patient study of the correct formation of signals, as of the utmost importance to themselves and the safety of the public. Rapidity will come in good time. The man who occupies the highest trust in the management of an office to-day is one we ourself appointed, not because of his quickness, but for his care; not because he could send 2,600 words in an hour, but because he made no errors and was never missing from his post of duty.

◆

Hon. William Orton, President of the Western Union Telegraph Company, sailed for Europe, December 8, on the Cunard steamer Scotia in company with Cyrus W. Field, Esq. The interlacing of American and European commercial interests by the introduction of steamships and telegraph cables, compels kindred associations among the managers of these time-destroying elements to meet their widening and interpenetrating necessities. So the representatives of the lightning on the land and in the sea, go together to look at the numerous relations in Europe which, by virtue of marriage, have become their kindred, and to ascertain how far it is possible still more to simplify, economize and quicken international electric intercourse. To do this, parties must meet face to face. They must come in contact with the interests they seek to quicken, and confront the opportunities which demand the service of far seeing and royal enterprise. The ease with which cables are strung along the oceanic ravines; the energy with which the great lines from London and Paris to India and China are being pushed; the universal stir and dare of European capital in belting up and interlacing the old centers of European commerce with India and the opening marts of China and Japan, all tend to stimulate American inquiry into the nature of that position which the New World sustains to the enterprise of the Old. So we bid these gentlemen a pleasant journey, a fruitful mission and a speedy return.

◆

FROM various sources it becomes apparent that the telegraphic service in Great Britain has been of very doubtful efficiency. The operators have been poorly paid, and, as a consequence, the duties have been performed by many persons of very limited ability. A European engineer informed us, personally, that no encouragement to talent in any but the most important offices was given. Wherever two shillings a week could be saved by turning an operator adrift and employing a needier, even if an inferior operator, the change was made. We do not like to believe all this, yet it has corroborative evidence. The service is differently regarded here. Men of character and skill are valued, and, so far as possible, encouraged. A process of alienation between employers and employed is our greatest evil and danger. Anonymous abuse, however feeble and ridiculous, is degenerating and vicious. The generosity, the gladness, the co-operation, the enthusiasm of the service in former years has been lowered by evident causes. We have watched it and the process has been depressing. Men, of course, will growl, put them wherever even they desire. Superintendents are not always above the temptations of authority, and now and then hurt where they might guide. Wherever men are found human weakness will show itself. We, however, hope for better days, unless a cut throat war imperils the compensation of labor. A lean treasury makes a bitter executive. The men who have urged opposition and challenged war will find no tears in our eyes if they find themselves fed from an ungilded spoon.

The Telegraph at Washington.

Washington, Dec. 14, 1869.

Editor Journal of the Telegraph:

Although ten days have elapsed since Congress has assembled, nothing in the telegraph line has yet cropped out. Strenuous efforts were made last summer, and continued until the report of the Postmaster-General was completed, to get him to open up the question of "The Postal Telegraph" (so-called), but being a man of more than ordinary shrewdness and ability, he made soundings enough to find that the water was too deep to venture in rashly, and so he wisely reported to the President that he had concluded to let it alone until the Post Office Department, in its legitimate sphere, made itself a self-supporting institution. Last year it sunk five millions of dollars, in addition to which there were a million more spent to get Brazilian and China mails carried monthly.

Now that E. B. Washburne has left the House, never more to return, there does not seem any one anxious to don his mantle but his brother, General C. C. Washburne from Wisconsin. He is preparing for a telegraph speech, and as he has no practical knowledge of the subject, and has never had the slightest opportunity to get any special information on the question, it betokens no little boldness to thus recklessly enter the arena.

Gen. Farnsworth, Chairman of the House Postal Committee, whose masterly report on the telegraph service of the United States was made to the House last Congress, is still in the House, where he is recognized as one of the ablest leading spirits there, may quietly make ribbons of Washburne's theory.

The question of foreign cables being landed on our shores will be taken up soon after the holidays, and the French cable will have to close business or Napoleon agree to allow an American cable to rest on his shores, free from censorships and untrammeled with conditions that make Republicans grate their teeth to submit to.

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The receipts of the first ten days of December, at New York, compare almost exactly with the corresponding days of 1868.

Submarine Telegraph Extension.

London, December 7, 1869.—An English company is being formed to complete telegraphic communication between England and China, by way of India, and extend it to Australia by means of submarine cables.

Submarine Telegraphs—Communication in the East.

St. Petersburg, December 7, 1869.—The Czar has granted a concession for the formation of a company, with the right to lay a submarine telegraph cable or cables from some point on the coast of Asiatic Russia to establish telegraphic communication with China and Japan, the consent of the authorities of those countries having first been obtained.

◆

A Western reporter has "interviewed" a magnetic wave now on its way from the sun, and says it proposes to knock the earth to pieces.

◆

By request we design printing a few copies of Prof. Morse's likeness on fine plate tinted paper for the purpose of framing, which we will furnish, post paid, at 25 cents each. The likeness is excellent, and the engraving fine.

TARIFF BUREAU.

Semi-Monthly Circular.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
December 15, 1869.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since December 1, the date of the last tariff order. Please note them in your tariff book:

NEW OFFICES.

288 Ainsworth, Ill.
64 Alder Creek, reopened, N. Y.
349 Allenville, Mo.
271 Cicero, Ind.
292 Covington, O.
290 Edwardsport, Ind.
290 Freedom, Ind.
151 Freedom, Pa.
380 Gadsden, Tenn.
Grand Island, Neb., (heretofore an Other Line Office) 90 more than Omaha, Neb.
377 Glendale, Iowa.
470 Hallville, Texas.
308 La Prairie, Ill.
327 Normal, Ill.
*Pine Valley, N. Y., tariff same as Millport, N. Y.
474 Plattsmouth, Neb.
Rawlins, Wy., 225 more than Omaha, Neb.
409 Syracuse, Mo.
352 Sixty-two Mile Siding, Miss.
102 Westport, Pa.
290 Worthington, Ind.
32 Wilbraham, Mass.
130 West Panama, N. Y., reopened.

OFFICES CLOSED.

Trenton Falls, N. Y., for the season.

Neshanic, N. J., Berkshire, N. Y., and Point du Chene, N. B.

GENERAL INFORMATION.

The name of the office heretofore known as Monticello Junction, Ill., has been changed to Godfrey, Ill.

The following offices, heretofore known as "Other Line" offices, will hereafter be checked direct. Tariff same as heretofore:

Cimarron, N. Mex.
Pueblo, Cal.
Santa Fe, N. Mex.
Trinidad, Cal.
Ft. Union, N. Mex.

The P. O. address of Lamokin, Pa., is Lamokin, Chester P. O., Pa.

The following changes in tariff, to points on other lines from Lake City, Fla., have been made:

Baldwin, Fla.,	100.5.	Fernandina, Fla.,	100.8.
Jacksonville, "	100.6.	St. Augustine, "	100.10.
Gainesville, Fla.,	100.6.		

In Journal of Dec. 1st, notice is given that the name of the new office, Martin, Tex., should read Morlin, Tex. We are now informed that the correct name is Marlin, Tex.

North Scotland, N. Y., in Journal of October 15, should read New Scotland, and Quaker Station should read Quaker Street.

William Orton, President.

Executive Order Nos. 92 and 93.

NIGHT MESSAGES.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
December 3, 1869.

Referring to Executive Order No. 25, it is now ordered that

Lafayette, Ind.,
Terre Haute, Ind.,
Evansville, Ind.,
Dayton, O.,
Newark, O.,
Springfield, O.,
Xenia, O.,
Zanesville, O.,

be, from and after this date, added to the list therein designated as "Night Offices."

William Orton, President.

Executive Order No. 94.

December 15, 1869.

On and after January 1, 1870, messages will be received at and for all stations on our lines in the United States East of the Mississippi River, including St. Louis, for transmission during the night (*after all full rate messages have been forwarded*) and delivery the next day, at one-half the usual tariff rates, provided, however, that the tolls on any message at half rates shall not be less than twenty cents. Half rate messages are required to be written upon No. 45 blanks, a supply of which will be kept on hand at every office for such use only.

Messages to be transmitted at half rates will be received at any hour during the day between 8 o'clock A. M., and 8 o'clock P. M. at all offices, and until 10 o'clock P. M. at stations which receive night press reports.

Offices which do not keep open all night must transmit all half rate messages on hand to their destination, or to the nearest repeating office before closing.

Repeating and press report offices will forward all half rate messages during the night to their place of destination, or as near thereto as practicable, and such as are unavoidably left over, in consequence of the closing of the office to which they are destined, or from any other cause, will be forwarded the next morning.

In transmitting half rate messages, the operator will write the word "Ran" before he begins the same, in order to notify the receiving operator that a half rate message is coming which must be copied upon a No. 44 blank.

Half rate messages will be checked with, and constitute a part of the gross receipts of the day on which they are received for transmission.

At the end of each month all half rate messages will be carefully put up and forwarded through the Superintendents to the Auditor, endorsing the wrapper which encloses them with the name of the office, and with the number and amount of the messages.

As the object of establishing the half rate system is to create a business to occupy the wires during the night, Managers are required to afford every facility within their power to insure its success, and to observe and report any result affecting the interest of the Company.

No half rate message will be received for transmission from any other telegraph line.

On and after the first day of January, 1870, all orders heretofore made in respect to night and half rate messages will be regarded as abrogated.

William Orton, President.

Lovers Struck by Lightning.

The recent death of two lovers, struck by lightning in a field, is paralleled to a remarkable degree by an event which took place a century and a half ago, and which exercised the pens of three of our poets—Pope, Gay, and Thomson. It curiously marks the difference between the two periods, that the catastrophe was treated poetically at that time; whereas now our newspapers are 'ventilating' it as a matter of science, connected with currents, fluids, positive and negative electricity, and so forth.

Briefly, the episode in George I's reign was as follows (it will be found somewhat more fully treated in Chambers's *Book of Days*): On the 31st of July, 1718, John Hewit and Sarah Drew were in a field near Stanton Harcourt in Oxfordshire. They were rustic lovers; he about twenty-five years of age, and she a comely maiden a little younger. They were betrothed, and had on that very morning obtained the consent of the parents on both sides to their marriage, which was to take place in the next following week. Pope and Gay were both guests at Stanton Harcourt at the time; and the latter recorded the tragic incident of the day in the following words: "Between two and three o'clock, in the afternoon, the clouds grew black, and such a storm of thunder and lightning ensued, that all the laborers made the best of their way to what shelter the trees and hedges afforded. Sarah was frightened, and fell down in a swoon on a heap of barley; John, who never separated from her, having raked together two or three heaps, the better to secure her from the storm. Immediately after was heard so loud a crash as if the heavens had split asunder. Every one was now solicitous for the safety of his neighbor, and they called to one another throughout the field. No answer being returned to those who called to the lovers, they stepped to the place where they lay. They perceived the barley all in a smoke, and then spied the faithful pair; John with one arm about Sarah's neck, and the other held over her, as if to screen her from the lightning. They were struck dead, and stiffened in this tender posture. Sarah's left eye was injured, and there appeared a black spot on her breast. Her lover was blackened all over; not the least sign of life was found in either. Attended by their melancholy companions, they were conveyed to the town, and next day were interred in Stanton Harcourt churchyard."

It is believed that Thomson had this incident in his thoughts when he wrote the lines (in his *Seasons*) beginning

Young Caledon
And his Amelia were a matchless pair.

On Sunday, September 5, 1869, Thomas Hardaker and Emma Carrick were walking in the fields near Leeds, on a footpath leading from Stanningley to Farsley. The young man was a toy dealer; and the young woman a weaver, employed at one of the woollen mills which so abound in that neighborhood. The couple had been Sunday school teachers together, were betrothed, and had arranged to be married in a month or two. On the Sunday afternoon they took tea at the house of the poor girl's father at Stanningley; then walked to Farsley, where Hardaker was staying; and were returning when the catastrophe befell them. They took a field-path, and were last seen alive in conversation in a narrow road, bounded by two walls. They retreated a little towards Farsley, on seeing that a storm was coming on, and took partial shelter behind a garden wall. Two iron gates or palisadings were on either side of them at no great distance; and these metals are supposed to have had an intimate connection with the sad result. It was about nine o'clock in the evening, dark, and gloomy; rain fell slightly, then heavily, and vivid flashes of lightning were followed by terrible peals of thunder. The circumstances led to a supposition that the lightning, attracted by the iron of the first gate, swept onward to the second, and caught the hapless couple on the way. No one saw the death-stroke; but the evidence afterwards adduced lent support to this supposition.

At eleven o'clock on that night, a cloth weaver, passing that way, almost trod on the bodies of the two young people, who were lying across the footpath near one of the gates. He touched them with his umbrella, and bade them get up, thinking they were intoxicated; but as they were senseless and motionless, he hastened for a lantern. It was then found that the poor young people were really dead. Emma Carrick was lying flat on her face, Thomas Hardaker on his back; her dress was but little touched, but his right boot was split or ripped up. The only actual mark of lightning on the bodies was to be seen on the faces, which were scarred and burned about the forehead and nose. Besides the ripping up of the young man's boot, small holes were burned in his shirt and his purse. Gold, silver and copper, in the purse and the pocket, were partially melted; and two shilling pieces were fused together. So little was the discoloration of the faces, that when the lovers were laid out side by side, they seemed to be tranquilly asleep. No poet was near to write monody or epitaph; but the sad event made a deep impression on the neighbors, by whom the young couple were well known and respected.

◆

December 6th, 1869.

Editor Journal of the Telegraph:

Will some of your numerous readers tell me why earth circuits never form a cross at their points of contact underneath where land wires cross.

Surely there must be a point in the earth directly under the air wires where the two earth circuits come together, but it is obvious to all that they never form a cross.

They would naturally do so if of the same nature as land circuits, as we all know where two wires touch each other, neither can be worked without one being thrown open or "the cross" removed.

I have never seen the question stated in any work on telegraphy, although it may be well known to electricians.

Working two or more lines on the same ground wire or battery probably partakes of the same nature. If you think this too well known a theme, do not, of course, publish this.

[One of the clearest writers on electricity remarks: "I would advise the student to regard the earth as a vast reservoir, highly charged with electricity, and to regard a telegraph or a battery as an arrangement by which electricity is pumped out of the earth at one point and poured into it at another." Thus, although this same question has puzzled older heads than that of our correspondent, it will be seen that very much as the sea is to the innumerable pumps which suck its waters, so is the earth to the many wires which utilize its abundant bulk and conductivity. Ground wires which convey currents of different polarity to the earth are in point, as is also the use of a single wire to serve the same pole of a number of local batteries. To reach a given point there must be a directing wire over a portion of the circuit, the earth providing a return road to all with equal speed and ease on any track].

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William Ferguson.

◆

At the annual meeting of the Telegrapher's Mutual Insurance Association, the following resolutions were adopted:

Resolved, That, whereas, Mr. D. R. Downer has determined to resign the Secretaryship of the Telegrapher's Mutual Insurance Association, therefore be it

Resolved, That the members of this association accept such resignation and tender him and the other officers our united thanks for their past valuable services.

Resolved, That the recommendation of the Treasurer, providing for the payment of postages and other expenses from the amount due to the heirs of the member whose death causes the call, be adopted, and the Executive Committee authorised to draw up a clause to that effect, to become a part of the Constitution.

◆

Born.

December 13, at Burlington, N. J., to Mrs. S., wife of C. H. Schermerhorn, Manager Western Union Telegraph Office, a son.

◆

Married.

Brice—Miller.—At the residence of the bride's father, on Sunday, November 21, by Rev. J. H. Sterritt, Mr. John Brice, Manager Western Union Office, Niles, O., to Miss F. F. Miller, all of Niles, O.

The Secret of the Aurora Borealis.

The true nature of the aurora borealis has long been a perplexing mystery to men of science. Careful observations and comparison of accompanying phenomena have shown that solar disturbances, manifested by the appearance of spots of unusual numbers and dimensions, are followed or accompanied by intense magnetic action, affecting the whole electric system of the earth, and marked by brilliant displays of auroral streamers on the night succeeding the solar disturbance. This showed that a relation exists between the aurora, terrestial magnetism and the sun, but it left the precise way in which the sun excited the electric luminosity of the aurora as much in doubt as ever. At what elevation above the earth the auroral light exists, and whether within or beyond the regions of our atmosphere, was also unknown, and the most eminent men of science were at variance as to the possibility of ascertaining the actual distance of the silently shifting streamers of light in the northern sky.

Spectroscopic analysis, that has so wonderfully expanded the limits of scientific reseach, was some time since applied to the light of an aurora with unlooked for results. Instead of a parti-colored band of light, which might have been expected, showing that the aurora was due to solid particles excited to luminosity by electric action, it gave the single line of light characteristic of incandescent gas. But the line produced by each gas has its own position in the spectrum, and the line of the aurora does not correspond with that of any gas with which chemists are accquainted. Repeated observations by several skillful experimenters give always the same result. They can pronounce only that the aurora is due to the incandescence of a gas different from any known to science.

But another discovery has been made which, from its connection with the former, is of great interest. The zodiacal light, that faint gleam in the sky which has hitherto been supposed to be due to the light reflected from a vast number of minute bodies travelling round the sun within the orbit of the earth, has been an object of great interest to astronomers. It has, until recently, never been subjected to spectroscopic analysis, because its light is so faint that it was thought its spectrum could hardly be made visible. It was presumed, however, that if a definite spectrum could be obtained, it would present, as the accepted theory of its origin required, a feeble likeness of that of the sun. A German scientist has at last succeeded in observing the spectrum of the zodiacal light, and instead of being as expected a faint copy of the ordinary prismatic spectrum, it presented only a single line, and that identical with the spectrum of the aurora. This proves conclusively that the previously received theories of the nature of the zodiacal light were erroneous, and that it and the aurora are due to the same electric influences operating in the same medium.

It is now believed by astronomers that the same methods of inquiry will show, when an opportunity occurs for making the test, that the tails of comets are of the same nature with the aurora and zodiacal light; if so, three of the most mysterious phenomena of the heavens will be traced to a common origin and their nature partially explained.

◆

A Sensible Dutchman. I shall tell you how it vas. I puts mine hand on mine head, and dere vas von pain. Den I puts mine hand on mine pody, and dere vas anoder. Den I puts mine hand in mine pocket, and dere vas notting. So I jined mit de temperance. Now dere is no more pain in mine head, de pain in mine pody vas all gone away. I put mine hand in mine pocket, dere vas twenty dollar. So I shtay mit der temperance.

Handsomely Done.

Mr. Hayward, long and favorably known as manager of the Western Union Telegraph Office, and division operator of the Ohio and Mississippi Railway at Vincennes, Ind., was presented with a splendid gold watch, chain and Knight Templar's emblem, on the 27th ult., at his residence in that city, by a large number of his fellow operators.

The presentation was made by our old friend C. W. Temple, Esq., Superintendent of Telegraph, in a few neat, impressive and well chosen words. Mr. Hayward's response was in his usual happy style.

In conclusion, an "entertainment" worthy of the occasion was enjoyed by those who were present.

The chain is a very handsome one, costing $115, and is a present happily conceived and worthily bestowed, and for which Mr. Hayward may feel justly proud.

◆

Anson V. Carr, long connected with the telegraph office, Montana, Iowa, and whose gentlemanly bearing and exemplary conduct had won for him the universal esteem of his fellow citizens, died in Fulton, Ills., on the afternoon of the 7th, of typhoid fever. As an evidence of the high estimation placed upon him by those who knew him most intimately, the following preamble and resolutions were adopted at a meeting of the telegraph operators in Montana:

"For the first time in the history of our circuit, our little brotherhood has been visited by death. His call has been sounded along the line, and one whom, it seemed, could least be spared, has answered the summons. Fortunate is he who, departing, leaves so pleasant a memory.

"*Resolved*, That, remembering his many genial and amiable characteristics, and cherishing his memory with affectionate respect, we humbly bow to the decree of the Supreme Disposer of the affairs of men.

"*Resolved*, That, as fellow workers and associates of our friend, Anson V. Carr, we extend our heartfelt sympathy to his parents and family in their great bereavement.

"*Resolved*, That, as fellow telegraphers, as a token of our respect and kind remembrance, we will decorate our offices for ten days with the usual badge of mourning.

"M. M. Towne, E. F. Yorke, K. D. Root, Frank H. Britton, J. K. Gullihur, Frank Kendall, A. Bathrick, T. W. Cox, E. G. Holiday, M. O. Robertson, S. G. Bangs, F. D. Tracy, H. C. Newton, F. H. Morgan, H. H. Hunt, C. K. Spinnor, C. G. Ashley, R. S. Todd, E. A. Franklin, Jno. Morse, E. D. Bailey, E. Bailey, C. F. Resegue, John B. Saxby, W. A. McElroy, S. D. Fulner, J. W. Belding."

◆

Electrical apparatus for giving notice when a given temperature is reached in hot-houses or other places where only a certain heat is needed, are well known. A platinum wire being inserted in the bulb of a mercurial thermometer, and another projecting into the tube as far as to the degree on the scale which it is desired not to pass, the mercury expanding with the heat completes an electric circle between the platinum points, and a bell rings to give notice of the same. An ingenious contrivance for indicating when the temperature of a room falls *below* a certain point is a German invention, just brought out. It consists of a U-shaped spirit thermometer. Two platinum wires, as before, are inserted, one in the bulb, and the other in one arm of the tube terminating at the minimum degree determined upon. Part of the tube is filled with mercury, so that as the alcohol contracts with the decrease of the temperature, the mercury rises until the platinum point is reached, and an electrical current, through connecting wires, is established.

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Journal of the Telegraph.

In Congress.

A bill has been introduced into Congress by Mr. Paine, requiring the Secretary of War to have meteorological observations made at the military stations in the interior and on the great northern lakes, and to give notice on the lakes and the Atlantic coast by telegraph of the approach and force of storms. Not likely to pass.

◆

A GRANT of land has been asked in aid of the Republican Valley Railroad and Telegraph Company.

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I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and the payment of dues.

XI. A meeting for the election of officers shall be held annually during the first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written request of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer.

GERRITT SMITH, Secretary,
A. S. BROWN,
W. H. HILL,
D. R. DOWNER,
Executive Committee.

DIRECTIONS TO APPLICANTS.

1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to D. R. Downer, Secretary Telegraphers' Mutual Life Insurance Association, 165 Broadway, New York, and a certificate of membership will be sent by return mail.

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

5. No letters can be answered unless a stamp is enclosed for postage; and as the officers labor without compensation, correspondence requiring answers should be as limited as possible.

By permission of the Western Union Company, and to avoid risk by mail, remittances may be made by an order signed by a Manager on John Horner, Cashier, New York office. Whenever practicable it is desirable this should be done.

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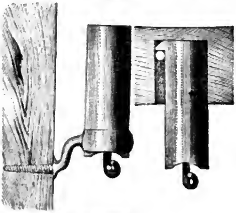

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1st. A current resistance in rain or fog, or in rain and fog, combined of 100,000,000,000 Ohmads.

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3d. Strength, not to break or part by any strain by, or that a No. 8 wire will bear.

It is not injured by missiles in the general acceptance of the term.

It does not depreciate from exposure to smoke, soot and the gases from combustion to one hundredth part of the extent of ordinary insulators.

It is not injured by atmospheric discharges. It is a protection to the poles from the same effects, there not being an authenticated instance of a pole being injured where these insulators are used.

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JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 3. NEW YORK, JANUARY 1, 1870. WHOLE NO. 52.

The Discovery of Oersted Contested.

In one of the latest numbers of an industrial journal of this city, appears the following passage: "The real discoverer of the fundamental principle which lies at the base of all the present different systems of telegraphs in use, was Oersted, of Copenhagen. For more than a century a relation had been known to exist between electricity and magnetism, but the nature of this relation remained a profound secret until, in 1819, Oersted discovered what has been called, after him, the law of Oersted, namely, that the magnetic polarity lies at right angles around the electric current and *vice versa*; the direct result is that any compass needle will place itself across the electric current, and the experiment illustrating this is called the experiment of Oersted. If ever a discovery was important in its far-reaching results it was this, and in the whole field of human progress there is scarcely another instance in which one single and simple principle bore such rich fruits, not only in regard to useful, practical application, but also in divulging to us some of the hidden mysteries of forces which appear to lie at the foundation of our very existence as living beings." I should have refrained from quoting these sentences, if they did not truly express the belief of the authors of our text books on physics and kindred sciences. But this being the case, I cannot but call attention to the fact that the Russian *savant*, M. Hammel (*vide* the *Bulletin de l'Academie de St. Petersburg*, Vol. II, p. 116), nine years ago, proved that the discovery so unanimously ascribed to Oersted, had been made seventeen years earlier—in May, 1802—by the Italian physicist Romagnosi; it having first been published in the *Gazette* of Trent.

Undoubtedly, political hole-and-corner journals are not the proper depositories for scientific discoveries, and it would rather be surprising if Oersted had searched for anything of this kind in such papers. However, an account of the experiments of Romagnosi was also inserted in *Izarn's Manuel du Galvanisme*, and in *Aldini's Essai theorique experimental sur le Galvanisme*, both of which were published in Paris in 1804. The discovery of Romagnosi must therefore have been known in scientific circles; besides, Oersted was in Paris in 1802, 1803 and 1813. He even maintained a lively correspondence with the author of the last named work. It can hardly be possible, therefore, that the Danish *savant* was not acquainted with the facts in question. Of these the first mentioned treatise states that "Romagnosi, a physicist of Trent, has discovered that the magnetic needle is deflected by the galvanic current." And in the latter, "according to the observations of Romagnosi, a physicist of Trent, the magnetic needle suffers a deflection when exposed to the electric current."

This, neither more nor less, constitutes Oersted's often praised discovery.

With all due respect to this investigator, one cannot but confess that, in relating his own experiments, it would have conferred more praise upon him if he had also mentioned the labors of others.—*Correspondence of the Scientific American.*

The Fruits of the Telegraph.

"One of the most complete and beautiful churches in the Diocese of Massachusetts, was consecrated on Tuesday, September 14th, under circumstances which made the occasion one of peculiar interest.

"It is a church erected at North Adams, by the munificence of a Christian lady, Mrs. Hiram Sibley, of Rochester, N. Y., on ground which was formerly part of the homestead on which she was born, but is now very near the center of a large and flourishing manufacturing town.

"Many years ago, Mr. Sibley removed to Western New York, and the usual rewards of business talent and energy have followed him in enterprises, some of which have made his name familiar throughout the commercial world. Simplicity of personal tastes and habits, during years of growing affluence, has resulted in placing at Mrs. Sibley's disposal the means, and an earnest love for the Church of her maturer choice, has supplied the motive for using them, for the erection of a place of worship far beyond the means of the parish for whose use it has been given. Natural affection and Christian faith have united in a graceful consecration of wealth to the honor of God in the uses of His Church. The cost of building has been defrayed by her, and the contributions of the parishioners have been devoted to furnishing the Church, and meeting other expenses incidental to such an undertaking, in which they have been aided by other friends of the parish.

(ST. JOHN'S CHURCH, NORTH ADAMS, MASS.)

"The consecration services brought together a number of the clergy, including the Rev. Dr. Peet, of Holyoke, the Rev. Messrs. Wells and Colburn, of Pittsfield, Johnson, of Bennington, Green, of Ashfield, Miles, of Lanesborough, Winslow, of Lee, Gilliat, of South Adams, and the Rev. Messrs. Weeks, of Catskill, and Tatlock, of Stamford, Ct., former rectors of the parish."—*The Churchman.*

By the politeness of C. H. Read, Esq., of North Adams, we are put in possession of a photograph of the edifice referred to above, which we have had engraved by a skilful New York artist and take great delight in presenting, as an evidence of what a warm hearted Christian lady can do, and because it is one of many blossoms which the telegraph has borne. It would be an interesting record could all the beneficent ends to which telegraphic success has been appropriated be recorded. The essentially beneficent character of the telegraph itself, as it unites society and adds to its means of enjoyment, seems to follow largely the uses of the wealth of its founders. Mr. Sibley, we understand, disowns any of the credit due to this generous gift, which we thus record, and we are more than willing to give his excellent and genial wife the whole acknowledgment which is due therefor. But, if Mr. Sibley did not conceive the project, he certainly united in it with heartiness and satisfaction, and the bills were paid from his well lined purse. Such work is the best medicine in the world, and a few doses of the same kind will put Mr. Sibley's health "on the most permanent and satisfactory basis."

The dedicatory sermon was delivered by Bishop Eastburn from Isaiah xxx. 20: "Thine eyes shall see thy teachers," in the course of which he expressed the gratitude of the citizens of North Adams to Mrs. Sibley for her munificent gift in appropriate terms, closing with the following words:

> "For what she has here done, I take this opportunity of publicly thanking her, and of thus adding my own expression of acknowledgment to the grateful feelings which, I am sure, fill the hearts of all whom I am now addressing. May the Holy Spirit shed down upon this Christian benefactor His choicest blessings, and may she find her reward in the benefits which this house of God will constantly impart. Those who are prompted by love for any town, city or village, which is endeared to them by fond recollections, to provide for its Christian privileges, confer upon it the highest good which benevolence can bestow. This good may she be permitted for many years to see as the effect of the work which her liberality has wrought."

Improving Wine by Electricity.

M. Scoutetten states that the accidental striking of lightning on the house of a vineyard proprietor caused the rupture of several large hogsheads containing wine, which found its way into a cavity existing in the cellar of the house. The owner imagined his wine lost and spoiled, but found to his astonishment, that the wine, instead of having been deteriorated, had become better than it was before. This accidental occurrence having come to the knowledge of General Marey-Monge, caused the author of this paper to be consulted, and a series of experiments were instituted with various kinds of wine, of inferior as well as medium quality, the result being that a galvanic current applied to the liquid in the casks, both electrodes consisting of platinum plates, eminently improves even very inferior kinds.

◆

A GOOD weather guide is made by placing in a glass tube or narrow phial, two drachms of camphor, a half drachm of pure saltpetre, a half drachm of muriate of ammonia, and two ounces of proof spirits. In dry weather the solution remains clear; on the approach of a change minute stars will rise up in the liquid, and stormy weather is indicated by the greatly disturbed condition of the chemical combination.

A Description of the Leclanche Battery.

(CONTINUED FROM PAGE 15).

Translated from the Notice Sur la Pile Leclanche.

BY GEORGE B. PRESCOTT.

Among these salts, it is equally important to choose that which would leave the depolarisation or the combustion of the hydrogen to operate the most freely, I have tried successively the salts of soda, potash, etc., and finally the salts of ammoniac, which, although having a composition entirely different, belong to the same family by their chemical properties. With the salts of the properly called alkaline metals the results have been invariably negative. The combustion of hydrogen had not taken place, or of the little that occurred so feebly, that with an element it was necessary to interpose more than two hundred kilometres of resistance in the circuit, in order to assure a constant current. In substituting for these salts any ammoniacal salt whatever, I have obtained immediately a pile which furnishes an electric current of great electro-motive force, and depolarising itself with extraordinary promptitude. This result, impossible to be supposed *a priori*, is however explained, when we compare the chemical actions that it performs in the two cases.

In the first case, for example, if we use the sulphate of soda SO3. ONa. the elements separate in the following manner: SO3. O will come upon the negative plate, and the liberated metal Na. is deposited upon the positive plate; but the water which holds the salt in solution is then decomposed, forms with the soda NaO, the hydrogen which has become liberated surrounds immediately the positive plate, and one part exercises a resistance, the other part, an electromotive force in contrary direction.

I ought then to say that when we place two poles of a pile in a single liquid of which the water has been rendered conducting through the medium of any metallic salt whatever, alkaline or other, the decomposition of water, if it takes place, is generally only a secondary action of electricity, as is proved by the following experiment.

In placing a solution of sulphate of soda, sufficiently diluted over mercury, and causing a current to traverse the liquid, care being taken to have the negative wire plunged in the mercury, we succeed after some time in establishing in the mercury a certain quantity of sodium. The electrical decomposition of solutions of alkaline salts, is therefore identically of the same species as that produced with the solutions of salts of superior metals, as for example, with the sulphate of copper, the difference which is only apparent, is due to the secondary action of the alkaline metal upon the water.

Returning now to the employment of an ammoniacal salt in a pile of a single liquid, see what will be the action of the electricity. Let us take for example of the sulphate of ammoniac, SO3 OAgH4. The sulphuric acid and the oxygen, SO3. O., appears, as in the preceeding experiment upon the zinc, and the compound AgH4, playing the role of a metal, will rest upon the positive plate without decomposing the water, and can be directly consumed by the peroxyde of manganese, which never takes place with the liberated hydrogen. This great difference of combustibility between AgH4, (ammonium) and the liberated hydrogen in presence of the peroxyde of manganese, is so substantial, that in the employment of the peroxyde of manganese in presence of an amalgum of sodium and water, we never obtain an appreciable trace of sesquioxyde or of interior oxydes, while by substituting an amalgum of ammonia to the amalgum of sodium, there is always a manifest reduction of the peroxyde of manganese.

In practice for the plate of peroxyde of manganese, I have substituted the crushed peroxyde confined in a porous vase: the positive electricity of this mass is collected by means of a carbon plate.

As ammoniacal salt, I have chosen the chlorhydrate of ammoniac (sal ammoniac of commerce).

In order to obtain the best results, certain precautions are necessary.

Care must be taken to choose a very pure peroxyde of manganese and a good conductor of electricity. The best is that which is known in commerce under the name of *manganese aiguillé*: it is crystalized, sericeous, and possesses a very marked graphuvoide brightness; it unites to these different characters a positive duration, and possesses a very considerable conducting power. In employing this peroxyde, we commence by removing the vain stone, then we pulverize the coarse grains; we pass it over a sieve, in order to suppress the powder, and add to it an equal volume of crushed retort carbon. We have thus a perfectly electrical conducting mixture.

The following figures which represent the polarity of the element, show the enormous difference which exists between the depolarisating power of fine and coarse powder

Fine powder, circuit closed.

During	15	minutes	polarity	=0.300
After	30	"	"	=0.450
"	45	"	"	=0.500
"	60	"	"	=0.510

Coarse powder, circuit closed.

During	15	minutes	polarity	=0.082
After	30	"	"	=0.090
"	45	"	"	=0.110
"	60	"	"	=0.118

According to this table we find that at the end of an hour, in the case of the employment of the fine powder, the electro-motive force falls near fifty in one hundred of its value, while that of the pile constructed with the coasre powder loses only fourteen in one hundred.

In these experiments I have only interposed a resistance of two hundred and fifty yards, in order to render the effects of polarisation as sensible as possible. This difference in the power of polarisation is explained by the difference of conductibility of the two mixtures.

The resistance of the fine powder amounts to 1,500 to 2,000 yards. As it is considerably more than that of the liquid which moistens the mass, the hydrogen in place of a uniform distribution in the mixture, is carried directly upon the carbon plate and is not absorbed.

The resistance of the coarse powder only reaches one hundred to one hundred and fifty yards, and being thus much more feeble than that of the liquid of the pile, the hydrogen is distributed and absorbed uniformly in the mass.

In practice, in order that the elements may enter upon their functions immediately after being set up, it is necessary to make the diaphrams very porous. If we cover with wax the superior part of the mixture contined in the porous vase, we can transport the pile without fear of the escape of the mixture; but it is necessary to make a hole in the wax to allow the circulation of air, when the vase is immersed in the liquid of the pile.

In regard to the solution of sal ammoniac it is well to employ concentrated; in putting an excess of this salt in the element it enters in solution only in proportion to its use.

Care must be taken that this solution is only permitted to cover one-half of the porous cup; the more the matter contained in the porous cup is dried, the greater are the conditions of its conductibility and working power.

We employ a concentrated saline solution because the oxychlorides of zinc which forms there are much more soluble than in a diluted solution. In practice, 4 ounces of sal ammoniac corresponds to 2 ounces of zinc dissolved in the element, and to 4 ounces of peroxyde of manganese.

In this species of battery, where no acid is used, we should, theoretically, be able to employ non-amalgamated zincs; but during the operation of the battery, the attack of the zinc causes at its surface a multitude of rough pieces, which become the seat of saline crystallization when there is a variation of temperature, while, by means of amalgamation, we have constantly a surface free from crystals; they fall to the bottom of the vase, neither adhering to the zinc nor, consequently, altering the conducting surface.

I have adopted, in practice, three dimensions of elements. The small one can perform an annual electric work represented by 1¼ ounces of copper reduced by the voltameter. The medium model can furnish with facility from 2 to 2¼ ounces per annum, while the large model produces, as required, a work of from 3 to 4 ounces. The small model, with porous cell of 4¼ inches in height, if sufficient for the service of secondary telegraph stations operating without relays. The medium model, with porous cells of 5¼ inches in height can be employed at the telegraph stations of the largest class, and operating with relays. The great model differs only from the medium model by the diameter of the porous cell, which is of 3⅛ inches in place of 2¼. This model is especially destined for the service of the railroad alarm bells and disks where the circuits are closed 20 hours out of the 24; it is necessary, in this case, to employ an apparatus of at least 25 miles resistance.

When the closing of the current occurs only on the passage of trains—that is to say, during some hours per day only, we can very well use apparatus of only 3 or 4 miles resistance. Thus we see that this battery is capable of the most varied application.

The elements of my system have a very considerable electro motive force: it is represented by 1.382, the electro motive force of the sulphate of copper battery being taken for the unit.

The resistance of the medium model is from ¼ to ⅓ a mile of No. 8 iron wire; the resistance of the large model is about ¼ of a mile of No. 8 iron wire; and that of the small size of from ⅜ to ⅜ of a mile of No. 8 iron wire. These relatively very small resistances are exceedingly advantageous in telegraphy, because the loss of current from the line by escape or derivation is felt much less sensibly, and, furthermore, it is to be remarked that this resistance remains nearly constant during the continuance of the battery, a result impossible to obtain with the batteries of sulphate of oxydule of mercury, in which the resistance continually increases and attains an average of a mile and a quarter, although at the start it was only a quarter to a third of a mile. This increasing resistance is due to the natural subsidence of the mercurial salt, leaving a bad conducting body, which tends to insulate more and more the carbon plate. In the manganese pile, on the contrary, the more considerable the subsidence the greater are the conductive conditions of the positive pole.

In practice, 40 Daniell cells are advantageously replaced by 28 manganese elements.

The Paris, Lyons and Mediterranean Company employ only six manganese cells to operate their bell instruments in place of 12 Daniell cells previously used.

Finally, in demonstrating the economical advantages presented by the application of my system to the electric telegraph, it is sufficient to make this simple comparative table.

MARIE-DAVY BATTERY.	LECLANCHE BATTERY.
The sulphate of oxydule of mercury costs from 30 to 35 cents per pound, supposing the residue saved and sold without loss, otherwise the cost per pound is 70 cents.	The cost per pound of manganese is from 17 to 18 cents.
The sulphate of oxydule of mercury never contains more than 3 in 100 of useful oxygen.	The amount of useful oxygen in the peroxyde of manganese is from 5 to 6 in 100.
The produce of sulphate of oxydule of mercury in the telegraph offices never exceeds 60 in 100.	The product of the peroxyde of manganese is nearly theoretical, considering its absolute insolubility in ammoniacal salts.

A manganese battery set up ready for action, but without work for a year, shows no other change than that resulting from the action of the air upon the zinc. This change is so insignificant that it only amounts to one-tenth of a grain of zinc. Consequently this element is always ready for action, though it has been put up for several years. The duration of manganese piles in use in telegraph offices are three years or more,* since this duration is always in perfect accordance with the work and the dimensions of the elements employed—a relation impossible to obtain with the old systems. This advantage is of great interest, especially to the railroad companies, which maintain now a number of telegraph stations called reliefs.

These posts only work in case of accident upon the line; they do not admit of a special employe, and they are generally situated 5 or 10 miles from a station. Naturally, the work of these posts is often nothing during the whole year, and nevertheless it is necessary to inspect them sufficiently often.

The Leclanche battery is in permanent service in the state telegraph offices of Belgium, Holland, Austria and Italy.

In France, the railway company of the east has adopted it upon its entire line.

The company of the west employs it in the telegraph stations, and particularly in the Tyers apparatus.

The companies of the north and of Orleans have also applied this system to th e numerous telegraph stations.

Finally, in conclusion, it is sufficient to say that the Paris, Lyons and Mediterranean Company has actually in service more than twenty-six thousand Leclanche elements.

◆

"Chock Full of Lightning."

A CORRESPONDENT on the wing in one of our Western States gives the following as an illustration of the ignorance of some practitioners in the West. He says: "I was invited home to dine one day by a regular M. D., a graduate of a regular Cincinnati college, who is doing a large business, and is worth perhaps $10,000. In the course of our conversation he mentioned the fact of his having lately been called to see a woman who had been struck by lightning. After stating his treatment in the case, he said that the results had not been satisfactory, and that if called to see a similar case again, he would pursue a different course. I asked him what that would be. Said he, "I would wrap her in a wet sheet to draw the lightning out of her?" "Why," said he, "she is chock full of lightning yit; you can see it run down her legs and arms every now and then, and she can feel it shooting through her body. Now, if I had wrapped her up in a wet sheet, the lightning would all have been drawn out, and she would have got well sooner." In answer to all my explanations of the laws of electricity, his reply was, that "He didn't keer for equilibriums or anything else, *he* knew she was chock full of lightnin' anyhow." This case is true in every particular, and the man has a diploma from a regular medical school, and one of the first in this country.

◆

An Electric Safety Lock.

MM. Duve and Lemaire, two young mechanicians in Paris, have invented a new kind of safety lock. The key opens the lock without ringing the bells; but if a false key be introduced, a "jemmy" or any piece of metal, the bells are set going as long as the piece is applied. This is effected by the disposal of the several tumblers with regard to a small lever which completes the battery circuit when elevated. When all the tumblers are lifted simultaneously, as by the master-key, the lever is not raised and no alarm is given; but if one, or two, or three be lifted, the alarm lever is raised and the ringing takes place. If the burglar, knowing the mechanism of the lock, try to force the lock plate by any of the usual burglar's instruments, as soon as the metal is attempted to be wedged in, the ringing commences. The safety lock can be applied to all the doors or fastenings without distinction. The acting agent of alarm is a feeble current of electricity, produced by a small battery of two elements. The pile used is that of Leclanche (small model), with peroxide of manganese and a single liquid, which does not require touching for several months, and then even a little water is all that is necessary to replace that lost by evaporation. The master-key is protected by an insulating substance, so that when introduced it establishes no contact, nor does it raise the alarm lever when the tumblers are lifted. Now, supposing a burglar to have a dozen or so isolated keys, he could introduce any one of them silently, but on his attempting to turn it, the wards not being those of the master-key, the alarm would be continuously given and put an end to his experiments, so that he could not try one key after another.

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The German Line.

Another line for Germany has been secured through the German-American Telegraph Company, who have obtained a concession from the North German Confederation to forward all messages from North Germany, not otherwise expressly directed. A three-wire cable is to be laid from North Germany to Lowestoft, two conductors to be used for German-English messages, and the third exclusively for German-American messages. This third wire is to be connected with one of the Anglo-American wires from Telegraph street to the United States, which is agreed to be appropriated, but not exclusively, for the transmission of German-American correspondence. The messages will be sent in the order of reception at the terminal and intermediate stations as required by the International Telegraph Convention. The Anglo-American and Newfoundland Companies are to give a rebate to the German Company on messages passing through the new cable and the Atlantic lines, but the chief source of revenue of the new company is expected to be the German-English traffic, which has increased enormously of late years. A hundred thousand thalers, caution money, have been deposited, and the necessary arrangements are being made.

Sentillation from Scientific Authors.

BY MADISON BUELL.

THE scientific knowledge of nature springs out of man's intellectual wants, out of an impulse of his soul to interpret the world wherein he lives, and the objects and appearance which daily ex

WE live in an age of intense mental activity and everlasting cerebral strain. Steam and electricity are tasked to bring daily tidings of what is happening all over the world, and impressions pour in upon the brain at a rate with which nothing in the past is comparable.

THERE is something ennobling in the triumph of Mind over Matter. Apart even from its uses to society; there is something sublime in the idea of man having trained that wild force which rushes through the telegraphic wire, and made it the minister of his will.

THE steam engine and the electrical telegraph are not the final achievements of science, but rather an earnest of what she is yet to do.

SINBAD THE SAILOR relates in his "Travels" that there exists near the North Pole a vast magnetic mountain of marvelous power, which draws the nails out of ships and is entirely covered with metallic objects attracted from the sea. It is thus that the Arabian poet describes in his own fashion the mines of loadstone which are plentiful in Scandinavia.

The aurora borealis is probably a daily phenomenon, but only of a variable intensity. These differences in its intensity will account for its not being always perceptible. The atmosphere is constantly charged with positive electricity. Electricity furnished by the vapors that rise from the sea, essentially in tropical regions, and the earth itself is negatively electrized. The recomposition or neutralization of the two contrary electricities of the atmosphere, and of the terrestial globe, is brought about by means of the greater or less moisture with which the lower strata of the air are impregnated. It is in the polar regions, where the eternal ices that reign there constantly condense the aqueous vapors, under the form of haze, that this recomposition must be brought about; the more so, as the positive vapors are carried thither and *accumulated* by the tropical current, which, setting out from the equatorial regions, where it occupies the most elevated regions of the atmosphere, descends in proportion as it advances towards the higher latitudes, until it comes in contact with the earth. It is there then that the discharges between the positive electricity of the vapors, and the negative of the earth must essentially take place, with accompaniment of light. When sufficiently intense, this phenomena of light announces that the equilibrium disturbed, has and is being reinstated, finally in the nominal distribution of its electricity. This phenomena being electrical and partaking of two kinds of electricity, it follows that when the aurora is very intense, an equilibrium is sought to be established by any conductors in connection with the earth, hence the disturbance to the telegraph wires. These disturbances vary in intensity, and are manifested in places where the aurora is not visible. The intimate and constant connection that reigns between the phenomenon of the aurora borealis and terrestial magnetism, led M. de Humboldt to designate under the name of *magnetic storm*, the whole of the disturbances that are manifested in the equilibrium of the magnetic forces of the earth.

After a brilliant aurora borealis, we may be able to recognize on the following morning, trains of clouds, which, during the night, had appeared as so many luminous rays.

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* The office at the freight depot of La Vilette, belonging to the Eastern Railway Company, having a relatively large telegraph service, has worked with perfect regularity during two years and a half, only using the small elements containing but 70 grammes of manganese, because the expenses of the piles required there are nearly the same as those of an ordinary station. More than sixty thousand manganese elements are actually in service in different railway companies in France and elsewhere. Of numerous telegraph batteries, set up more than two years, none have ceased to work with a regularity in all points confirmatory to theory.

An Electric Lesson.

(From Punch.)

The Wires are up, the instruments are being fixed, and in about six weeks, we suppose, Lord Hartington will appear in the character of the Electric Spark. In other words, the new system of Telegraphs will come into play. The post office expects every man and woman to do his and her duty. We are bound to send millions of messages. Therefore, as we are to have only twenty words for a shilling will it not be well for everybody to study the art of condensation of language? Remember, your messages will not be sent if they contain too much; at least we imagine not, as the chances of a receiver liking to pay an extra shilling or two for a piece of chaff, or an intimation that Aunt Maria's cold is rather better, are too small to justify Lord Hartington in speculating on being paid at the door. Now, Punch has observed that many worthy people find much difficulty in tying up a message in a small parcel, and he thinks that these long evenings may be profitably spent in acquiring electric literature. It will be a pleasing recreation for the father of a family to assemble his beloveds around the moderator, and to encourage them to prepare in the neatest form a message suggested, at full length, by himself. For instance:

Paterfamilias. Now, my dears, all got pens, ink, paper? All right. Now attend. What I wish to say is this:—"In consequence of the great prevalence of indisposition, the extravagant prices of provisions, and the universal demands on charity, the dance and supper to which you were invited are postponed until next year."

Materfamilias. What's the use of making up a ridiculous message like that, which nobody in their senses would send?

P. F. Nobody, my love, is not plural, and it is a message which it is exceedingly likely that many reasonable persons will dispatch.

Louisa, Helen, Matilda, (looking up alarmed.) Papa can't mean to hint——

Bob. What a lark! I hate dancing.

P. F. Papa never hints, my dears, and Bob will have the goodness to keep his ornithology for his schoolfellows. I am not thinking of putting off Helen's party, (in a sly undertone) I am too happy to think that we are going to get rid of her.

Helen. I will box your ears, dear, presently.

P. F. I can wait. Now, go on, while I examine these most facetious pictures in our friend Punch's new pocket book.

[A pause of ten minutes, broken only by occasional mutterings of "O bother!" and chuckles from Master Bob.

P. F. All done? Now mamma, you first. Let's see.

M. F. It is such a silly message that I have scarcely had patience with it.

P. F. So it appears. (Reads.) I am sorry to say that papa has thought proper to put off the party. He will explain. That does not, you see, come from me, and it does not comply with the condition, which was that the explanation should be in the message. women can not do what they are told.

Louisa. See whether girls can. Here is mine.

P. F. That looks better. Circumstances over which we have no control—well done, Loo—reluctantly compel us—no, the circumstances are not reluctant, dear—to postpone the party until next month. Next year, miss, I said. Yours is better than mamma's, but a failure for the same reason.

Helen. Look at mine.

P. F. Helen has been writing such heaps of letters lately that she ought to be skillful in expression. Mr. Paterfamilias regrets—no, he does not—that indisposition and other causes compel him to postpone the party fixed for the 30th. But you should have mentioned the other causes, Helen.

Helen. They are too idiotic. The idea of your caring about the price of lobsters!

Louisa. And the utter absurdity of the idea of giving up a party that you might buy soup tickets for beggars!

P. F. Still, I did myself the honor of requesting you to assign those reasons, and when we are playing a game, let us play by rule.

Matilda. Well, I felt that, dear, so I have put it all in.

P. F. Obedient child. Voyons!

Bob. Is that French, Governor?

P. F. Yes, sir.

Bob. All right. I only asked for information.

P. F. Nobody wants information more. Take that, sir. Well Matilda let us see. "Considerations of health, economy, and philanthropy necessitate the postponement of the festivity contemplated on the 30th instant." You are a credit to your governess, my love; and by the way here is the watch I promised you.

Matilda. You duck!

M. F. You goose! Why, a stilted stuck-up message like that—a lump of starch, I must say—would make people think it was a hoax, or that you had gone cracky.

Bob. Well, I feel that, as Matilda says, so I have expressed myself with an elegant freedom that can not fail to propitiate the admiration of any intellectual ears.

P. F. Hand over the effort, and wipe up that ink—not, I submit, with your handkerchief.

The Four Ladies. Horrible boy! Ring!

P. F. A moment. I hate to be interrupted, though I ought to be used to it. Noses damp——

Helen. Bob!

P. F. Grub dear——

Matilda. Vulgar child!

P. F. Fellow creatures destitute——

Bob. Please to observe the alliteration—there's art!

P. F. No time for hops and spreads. Spectatum non-admissi risum teneatis, amici?

Bob. Notice that master-stroke, Some little familiarity in the English, relieved by the fortunate classical quotation.

M. F. (rather proud of the monkey, for all the ink). What does it mean, dear?

Bob. (extempore):

"If guests come here, and can't get in,
I think they'll all begin to grin."

P. F. (proud, too, but concealing the fact). Robert, you are not a fool, but your wisdom hath not appeared in this composition. The prize is with Matilda, but here's half-a-sovereign for you. We'll try this again another night.

Matilda and Bob. By all means, papa.

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At the annual meeting of the stockholders of the United States and Mississippi Telegraph Company, in this city on the 6th inst., Wm. Orton and O. H. Palmer, of New York, Anson Stager, of Chicago, E. Creighton and W. B. Hibbard, of Omaha, and H. M. Porter, D. H. Moffat, Jr., Wm. N. Byers and B. F. Woodward, of Denver, were elected trustees for the ensuing year. At a subsequent meeting of the trustees, Wm. Orton was elected president; H. M. Porter, vice-president; B. F. Woodward, secretary; O. H. Palmer, treasurer, and W. B. Hibbard, superintendent of the company and its lines for the same period.—*Daily News, Denver, Dec. 8.*

Correspondence of the Journal of the Telegraph.

The Telegraph on the Isthmus.

Aspinwall, U. S. of Colombia, Dec. 15, 1869.

Editor Journal of the Telegraph:

Of the Panama Railroad Company's 47½ miles of telegraph line, there is but little to relate.

As we have but a single wire it is obvious that no "crosses" can possibly interrupt communication. During the eight months' rainy season the line works rather better than the remainder of the year, as the water seems to improve the connections.

Probably the most violent thunder storms in the world occur on this Isthmus, and at times very powerful discharges of electricity occur on the wire, rendering it imperative to suspend business for an hour or more.

Accidents, however, are of rare occurrence, and with thermometer averaging 82 degrees the year round, we are not bothered with snow storms and consequent "breaks."

As it may be of interest to the "overworked" members of the fraternity, I will mention that our "office hours" are from 6.30 A. M. to 4 P. M., with two hours allowed for breakfast; the business is by no means laborious, and salaries, payable in gold, are 50 per cent. higher than paid in the United States at the present time· *all positions are permanently filled!*

It is understood that the Havana Cable Company, Mr. W. H. Heiss, Superintendent, purpose extending their line by cable from Cuba to Jamaica, thence to Aspinwall, crossing the Isthmus. Another cable is to be laid from Panama to Callao, Peru, and to Valparaiso, Chile; thence by land through the entire territory of South America back to some favorable point on the Atlantic, for instance, Trinidad; then by cables again to the half circle of the Caribbe or Windward Islands of St. Vincent, Barbadoes, St. Lucia, Martinique, Guadaloupe, and fifty others to Puerto Rico, San Domingo and Jamaica, making a complete circuit of probably seven thousand miles or more, depending upon the route, and the various branches of the line throughout South America.

This line, an American enterprise, with Yankee managers, etc., will in a couple of years undoubtedly furnish employment to a large number of "Yankee" operatives, with liberal salaries, under the incomparable Morse system, instead of the "needle," with English operators, at *a pound per week.*

DESCRIPTIVE.

The beauties of Aspinwall do not appear to be fully appreciated by residents of the Isthmus, though the city is delightfully situated on the shore of the majestic Atlantic, whose waters partially encircle it, while the languid Fox River, with its hundred isles, completes the Island of Manzanillo, upon which it is located. Its handsome cottages, pleasant drives, and splendid promenades, must attract the notice of the tourist who wanders along the banks of the romantic bay on whose bosom float the commercial fleets of the world, and the climate is acknowledged to be equal to that of Saratoga or Newport in the balmiest months of Summer.

"Here Ischia smiles o'er liquid miles,
And yonder, bluest of the isles
Calm Capri waits, her sapphire gates,
Beguiling to her bright estates."

HEALTH OF THE ISTHMUS.

The sanitary condition is considered excellent; there are no epidemics, such as cholera, yellow fever, and small pox, and but few cases of the ordinary Isthmus fever, which is now not considered at all dangerous, and notwithstanding that violent diseases have recently appeared in some portions of the West Indies, this locality is remarkably healthful.

WEATHER.

The rainy season, just concluded, has been a very dry wet one, and only occasionally "All day the low hung clouds have poured their garnered fulness down," so for a number of months to come we are to have the Trade Winds, and a sort of perpetual Spring, as long as it continues. This invigorating dry season has a tendency to render a life in the Tropics correspondingly enjoyable, when we call to mind the wintry zephyrs that often sweep upon the cities of the lakes.

More anon,

SANTIAGO.

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The Service.

APPOINTMENTS—OCTOBER, 1869.

E. C. Cook, 145 Broadway, N. Y.
H. L. Granizow, 145 Broadway, N. Y.
S. S. Bogart, 145 Broadway, N. Y.
George Blanchard, Sandy Hook, N. Y.
R. H. Barrett, Corn Exchange, N. Y.
William Howey, Grand Hotel, N. Y.
R. Williams, Madison Square, N. Y.
W. H. Reese, 85th street, N. P.
E. P. Reardon, relief, N. Y.
A. N. Metzler, Kentville, N. S.
George Leslie, Halifax, N. S.
George A. Marques, Portland, Me.
Edward O. Chase, Portland, Me.
C. T. Bloomfield, Bangor, Me.
J. H. Lincoln, Alburgh Springs, Vt.
C. R. Richards, Grout's Corners, Mass.
H. A. Bessett, Jonesville, Vt.
Thomas Steward, Jr., Albany, N. Y.
James McDonald, Brewster, N. Y.
Henry Kronz, Chappaqua, N. Y.
Miss J. M. Christie, Nyack, N. Y.
H. B. Willetts, West Point, N. Y.
Irving S. Risley, Allentown, Pa.
T. Q. Waterhouse, Cape Island, N. J.
J. Fleming, Milford, Del.
John C. Benckert, Philadelphia, Pa.
George E. Cromwell, Philadelphia, Pa.
J. T. Anderson, Princeton, N. J.
C. L. Laverty, Scranton, Pa.
W. H. Etter, Trenton, N. J.
G. D. Ward, Parkersburgh, W. Va.
W. F. Stone, Hartford, Conn.
Miss A. P. Jones, Ashland, Mass.
Geo. W. Chapin, E. Hampton, Mass.
Sadie L. Gorham, Fairfield, Conn.
E. P. Lucas, New Rochelle, N. Y.
J. H. Ingraham, Providence, R. I.
Henry B. Tannatt, Springfield, Mass.
K. E. Beckwith, Thompsonville, Conn.
J. L. Barnes, W. Brookfield, Mass.
Mrs. E. B. Beardslee, Boston, Mass.
A. H. Babb, Boston, Mass.
F. A. Babb, Boston, Mass.
E. F. Leighton, Boston, Mass.

TRANSFERS.

Name.	*From.*	*To.*
J. W. Woods....	Sandy Hook, N. J........	145 Broadway, N. Y.
J. Mitchell,......	Canal Street, N. Y	Chambers St., N. Y.
Gilbert Morris...	Shediac, N. S....	Sussex, N. B.
A. B. Davidson.	Sussex, N. S....	Shediac, N. S.
J. H. Frink.....	Bangor, Me....	Portland, Me.
A. F. Pillsbury ..	Portland, Me...........	Bangor, Me.
R. B. Pillsbury...	Belfast, Me..............	Bangor, Me.
J. Lincoln	Jonesville, Vt.....	Alburgh Springs, Vt.
H. A. Wells....	Scranton, Pa...........	Baltimore, Md.
G. W. Reed.....	Cape Island, N. J.......	Swedesboro, N. J.
Samuel Bracken.	Newark, N. J...	Philadelphia, Pa.
Thos. Brown....	New Brunswick, N. J....	Newark, N. J.
J. H. Simpson...	Philadelphia, Pa........	New Brunswick, N. J.
G. W. Snyder....	Boston, Mass....	Philadelphia, Pa.
E. S. Champion..	Manumuskin, N. J.	Millville, N. J.
J. K. Butler.....	Stamford, Conn.........	Bridgeport, Conn.
J. F. Clavardon..	" "	" "
E. A. Beardslee..	Bridgeport, Conn........	Boston, Mass.
M. P. Conway. ..	New Rochelle, N. Y......	Stamford, Conn.
John E. Wright..	Duxbury, Mass	Boston, Mass.
Geo. E. Snyder..	Boston, Mass............	Philadelphia, Pa.

RESIGNATIONS.

C. Dwyer, New York.
W. J. Landy, New York.
J. R. Johnston, New York.
Miss F. Geddings, New York.

George W. James, Halifax, N. S.
David Lyons, Kentville, N. S.
C. C. Stevens, Alburgh Springs, Vt.
G. W. White, Grout's Corners, Mass.
T. H. Laurence, Albany, N. Y.
E. H. Burd, Allentown, Pa.
John F. Radigan, Baltimore, Md.
Levi M. Levy, Philadelphia, Pa.
W. B. Neilds, Parkersburg, W. Va.
Annie R. Sturgis, Fairfield, Conn.
H. M. Arnold, Kingston, R. I.
F. Wheaton, Bridgeport, Conn.
Geo. R. Penn, Springfield, Mass.
Carrie S. Van Horn, Thompsonville, Conn.
Sanford Adams, W. Brookfield, Mass.
Thomas Carter, Boston, Mass.
A. M. Leavitt, Boston, Mass.
John E. Grant, Boston, Mass.
B. U. Bugbee, Boston, Mass.

◆

MR. HOMER CLUTE, formerly Manager Western Union Telegraph Office, Scranton, Pa., has been appointed Superintendent of the Lehigh Valley R. R. telegraph lines, headquarters Mauch Chunk, Pa. Mr. Clute has been engaged during the past year constructing lines between Easton, Pa., and Waverly, N. Y., and over the Mahoning and Hazleton Divisions.

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MR. J. F. MORRISON has resigned his post as operator, 145 Broadway, and connected himself with the N. Y News Association.

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Telegraph International Bill.

SENATE.

December 17.

The Senate, as in Committee of the Whole, proceeded to consider the bill (S. No. 116) relating to telegraphic communication between the United States and foreign countries. The bill in the first section provides that whenever communication shall hereafter be established between the United States and any foreign country by means of telegraphic or magnetic lines or cables laid in any part thereof in and over the waters, reefs, islands, shores and lands within the jurisdiction of the United States, the same shall be subject to the following conditions, stipulations, and reservations:

First. The Government of the United States shall be entitled to exercise and enjoy the same or similar privileges with regard to the control and use of any such line or cable and the lines or cables connected therewith that may by law, agreement, or otherwise be exercised and enjoyed by any foreign Government whatever.

Secondly. The United States Government shall at all times be entitled to the use of any such line or cable and the lines or cables connected therewith, by a telegraphic operator of its own selection, to transmit any message to and from its military, naval, diplomatic, and consular agents; and such messages shall be entitled to take precedence of all other messages.

Thirdly. The rates to be paid for the transmission of any such message or messages, when not otherwise fixed by agreement, shall be established by the Postmaster General of the United States.

Fourthly. The lines of any such lines or cables shall be kept open to the public for the transmission for daily publication of market and commercial reports and intelligence, and all messages, dispatches and communications shall be forwarded in the order in which they are received, except as hereinbefore provided.

Fifthly. It shall be at all times within the power of Congress to determine the rates to be charged for the transmission of messages and communication over any such line or cable, and to fix and establish such rules and regulations in relation thereto as it may judge necessary.

Sixthly. Before extending and establishing any such line or cable on or over any waters, reefs, islands, shores and lands within the jurisdiction ot the United States, a written acceptance of the terms and conditions imposed by this act shall be filed in the office of the Secretary of State by the company, corporation, or party proposing to establish telegraph communication.

The second section provides that subject to the foregoing conditions, stipulations and reservations, and subject to the terms of such grants as have heretofore been made by Congress for laying and maintaining telegraph cables between the United States and foreign countries, the consent of Congress is hereby given to the laying and maintaining of telegraphic or magnetic lines or cables between the United States and foreign countries in and over the waters, reefs, islands, shores and lands within the jurisdiction of the United States; subject, however, to any and all rights of property and State jurisdiction in and over the same. It is declared, however, that the privileges conferred by the act shall not be enjoyed by any company or persons whose line or cable by its connections or otherwise terminates in or extends to any foreign country in and by which similar privileges are not conferred upon companies incorporated by the authority of the United States, or of any State ot this Union.

MR. SUMNER. Since this bill was reported from the Committee on Foreign Relations, where it was very carefully considered and digested, a cable has been landed on our shore from France, and that makes it important to modify the bill, so as to render its provisions applicable to that cable. I therefore propose, in the third line of the first section, to strike out the word "whenever" and insert the word "all," and after the word "communication" to strike out the words "shall hereafter be established," so that the clause shall read: "That all communications between the United States and any foreign country," instead of reading, as it does now, "that whenever communication shall hereafter be established between the United States and any foreign country." The effect of the amendment is to make this language precisely applicable not only to all future cables, but to all existing cables, and it proceeds, as Senators who give attention to the bill will see, with a regular code, if I may so characterize it, on the subject equally applicable to all.

MR. CONKLIN proposed the following additional article in place of Mr. Sumner's amendment:

And provided further, That this act shall apply to the cable known as the French cable, heretofore landed on the coast of Massachusetts.

MR. POMEROY offered the following:

And be it further enacted, That as the President of the United States gave permission to land a French cable upon this American soil only upon the express condition that this English-French Cable Company, or France, should secure the same privilege of landing and enjoying the use of an American cable upon French soil, and such reciprocity not being secured, the President of the United States be, and he is hereby authorized and directed to cause to be removed the said French cable from the jurisdiction and waters of the United States, and the working and operating of said French cable shall cease within the jurisdiction of the United States until a satisfactory treaty on ocean telegraph cables shall be made and ratified between the Government of France and the United States, or some other concession from France effected equally satisfactory.

MR. CONKLIN offered the following:

But nothing in this act shall be deemed to require the New York, New Foundland, and London Telegraph Company, in case it shall elect to extend its cables to the United States reaching any point north of Cape Hatteras, to surrrender any rights in the British colonies heretofore granted the said company.

The bill and amendments led to an extended discussion on questions of retro-action, State rights, governmental privileges, &c., and was finally re-committed to the Committee on Commerce.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—
JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, JANUARY 1, 1870.

1870.

With all the world "and the rest of mankind," we hail the young year and bid it welcome. As kindly do we bid the departed year adieu. It has been vivified to us through all its seasons with mercies so radiant of blossom, and so abundant in wealth of blessing, that to be ungrateful would be to be less than man. We cannot cast the years from us as we do our worn out garments. Many a morning resonant with song and golden with unclouded sunlight and beauty have they born to us. The months of the past year have faded away like the faces of friends, the flash of whose kind eyes made the world sweet to us. Even the tears which, at times, would come, as some passing cloud pushed out the sun and buried up the stars, had rainbows on them before they dried, that told of returning light. We cannot, as some do, curse this fair world, nor the people therein. There are flowers on the face of the shaggiest rock that ever lifted its rugged face before the storm. They bud and blossom beneath the deepest snow. We have met no wave so troubled but the stars could gleam therein, no heart so hard that did not soften to some spell of sorrow or of love. So we kiss our hand to the departed year and the honored dead who sleep therein. So, too, do we kiss the fair brow of the young year, and offer our hand, with all it can give of hope, or love, or blessing, to those who with us hail its dawning.

◆

Western Union Stock.

The market having ruled low during December, many inquire as to its cause. We do not pretend to give an answer which covers every reason. Wall Street has arguments for a decline which are often unstateable. It is very often with stock as it is with rain. A moist earth tempts more rain to fall. So when, by any means, a New York bear breaks the market, a class of uneasy holders, resident at a distance, rush in to sell, and make that real which at first only rested on a pretence, and which a day would have corrected.

One cause of the low market undoubtedly has been the falling off in October receipts. It was certainly marked, yet not surprising. October and September this year seem to have changed places. September was heavier than was usual, and October lighter. Besides it should be borne in mind that the condition of business generally has materially changed from last year. Purchases have been limited to actual present necessities. There is an idea in the public mind of a speedy return to specie payments. Goods bought on a gold basis must be sold at a loss if on hand when this occurs. Therefore no one buys largely. There is a husbanding of resources against a time of possible peril. In all this the Telegraph sympathises. Sometimes, indeed, this very carefulness increases the use of the telegraph by the necessity of duplicating orders. But the consumer is as careful as the merchant. He also waits for low prices. He did not buy diamonds for Christmas because he expects to get them fifty per cent less next summer. He delays purchasing the carriage his wife wants for the same reason. So of a thousand other things. The Telegraph is an exponent of the commercial condition. The wires are idle when business subsides, even though a panic may, at first, double their use. Business is now moderately active but marked with great care. Telegraph receipts are fully up to the average of all other business.

When such a commercial and social continence thus occurs at a time when the tariff is being sensibly reduced, no sane man can expect any show of increase over a year when neither of these causes existed. He cannot and does not expect to see one industry fattening when others decline. There is a sympathy in all commercial action which nothing can prevent. He should be anxious only to see that his interests are under careful and judicious administration, and that no special peril bears upon the company. We believe that the former is as assured to him as the latter. The utmost care and economy is practiced in every department. The lines were never in such perfect condition. A large portion of the entire structures of the company is new and strong. The project to erect antagonist government lines has been abandoned. Opposing lines do not materially affect the average revenue. Business is relatively large and good. The property is immense, valuable and far reaching. The needs of the nation render its use indispensable and increasingly necessary. We know of no class of property based so squarely on great national necessities. This renders its value permanent. So we believe, think and write.

◆

International Cables.

President Grant, through the Secretary of State, has issued a circular to the ministers and diplomatic agents of the United States abroad, proposing a convention of all the maritime powers by which the neutrality of ocean cables may be secured. He proposes:

1. To declare the willful injury of an ocean cable piracy.

2. No concessions to be given which are not mutual, as between nations connected by cable.

3. Protection against espionage, both private and governmental.

This is a most laudable and spirited step, which we trust may be met with a promptness and heartiness befitting the age. We are pleased that to our government is due the credit of its initiation.

Uses of Electricity.

Among the latest uses to which electricity has been employed, is one which comes to us from Paris, where a physician has succeeded by the use of the electric current in changing the deep purple of a lady's nose to one of lily fairness and beauty. Now here is a chance for our bibulous aldermen. The proboscis of some of our jolly citizens, who haze late over the ruby cup, and "don't go home till morning," may not yield their ruddy glow so readily as that of the fair lady named, but at least they may hope. It is unpleasant to carry before one a signboard of burgundy, and beneath it a breath that is innocent of croton, and so this new invention may be welcomed by some as a needed accompaniment to the pastiles that hide the aroma of the hidden wine. We hope, however, it may fail, except where nature has given a red which belies the character and habits of its possessor. Let him that will drink rum, carry his signboard with him.

◆

The Modesty of Pomeroy, Jewett & Co.

Mr. Pomeroy of Kansas has submitted to the Senate a bill "To charter an American and Holland Ocean Cable Company," ostensibly in pursuance of Mr. Jewett's concession. Here are some of its provisions:

> "Sec. 3. *And be it further enacted.* That the American and Holland Ocean Cable Company, at the time of its acquirement of the concession rights granted by Holland and being fully organized, are hereby authorized to issue six per centum bonds, payable in twenty years, to the extent of ten million dollars, principal and interest payable in gold, five million dollars at New York, two million five hundred thousand dollars at Amsterdam, and two million five hundred thousand dollars at Frankfort-on-the-Main.
>
> "Sec. 6, *And be it further enacted,* That the interest on the ten million dollars of bonds issued by the Treasurer of the United States is *hereby guaranteed by the United States of America.*"

Is not this sublimely modest? It seems impossible that such utter presumption could be exhibited by a Senator of the United States. From Jewett the proposal is as natural and characteristic as usual. What next?

◆

Cheap Rates.

Under the plea of an "oppressive tariff," and the promise of "cheap rates," opposition lines find the chance of being born. They come into the world with a wooden spoon in their mouths, content to be fed on the simplest and lowest rations. But the first tooth has scarcely cut the gum before the taste of blood comes, and wherever a people can be safely bled the ivory enters.

Here, for example, is a line built along the Monongahela Valley by the telegraph company whose president lately blew the cheapest kind of horn to attract the wonder and gratitude of an oppressed people. No rival wires disturb Mr. Thurston's sway over that serene region. One would expect that here he would exhibit his cheapest charms. But, alas! Eve was Mr. Thurston's mother, as well as ours, and he warms to the apple. So the first office opened twenty-two miles from Pittsburgh, is charged for that distance fifty cents for ten words! Eight miles farther, the charge is fifty-five cents. Six miles more sixty cents! and so on, or about the average passenger fare on a first-class railroad! Alas! alas! for public virtue, when a corporation, clad in the modestest robes of chastity and charity, thus forgets all its self imposed mission. Yet it may be necessary thus to suck this lonely cow, to feed the mouths who do the sisterly duties of charities elsewhere. We much fear, however, that Mr. Thurston's company have fallen, like so many more, into the thirst for gold,

"That last corruption of degenerate man."

OFFICIAL STATEMENT.

Western Union Telegraph Company.

	Nov. 1869.	Nov. 1868.
Total Receipts.	$600,486 77	$607,728 05
Total Expenses	402,025 70	383,024 46
Net Profits	$198,461 07	$224,703 59

◆

Edwin M. Stanton.

The death of the Hon. Edwin M. Stanton adds another to the record of the names of those who were identified with the early history of the telegraph in the United States, and who have now passed away. In the year 1848, Mr. Stanton was counsel for the "O'Reilly" Telegraph Companies vs. F. O. J. Smith, and was subsequently a member of the Board of the P. C. & L. Telegraph Company of which Gen. J. K. Moorhead was President, and whose successor was Chief Justice Chase. Mr. Stanton was a man of peculiar, abrupt, heroic qualities. In the working up of a great case, he threw himself so into it, casting aside his coat, vest, necktie, every thing that impeded him, that there was a ferocity of labor, such as none who have seen him thus engaged ever can forget. His mind was like his frame, powerful rather than fine, but inexorably direct and just. He hated meanness and took no pains to conceal it. His laugh was a perfect explosion. We knew him intimately. No two could be more different, yet his reception of us was always kind to gentleness. His conversation was eminently enjoyable. His memory will always be sacred. No truer man ever held a national trust.

◆

The annual ball of the New York Telegraphers' Union, will take place at Apollo Hall, January 18th. The managers are J. B. Oltman, J. C. Stewart, Waldo Collins, W. H. Redding, and M. K. Tompson, all good looking men, and nimble of foot.

◆

Mr. Washburn's Telegraph Bill.

The new bill for a postal telegraph provides:

1 All private telegraphs to cease July 24, 1871.

2. Private lines to be appraised and purchased.

3. The lines to be worked as a part of the postal system of the country, and the messages payable by stamps affixed thereto.

4. A uniform tariff of twenty cents for thirty words including date, signature and address.

5. Offices to be opened wherever postal receipts amount to one hundred dollars per annum.

6. The money order system to be applied to the telegraph.

7. The Postmaster General to contract for foreign connections by cable or otherwise.

8. The establishment of a National Telegraph Bureau.

9. The lines to be under five superintendents of divisions, to be appointed by the President at a salary each of $5,000 per annum.

10. The system to be under a Director General at a salary of $6,000 per annum.

It will be seen that the proposal is now no longer to erect opposing lines to contest for business against private companies, but to purchase existing interests. That is a vast advance on the scheme of Washburn the First, but which the nation will not consummate. The proposal to work the telegraph lines of the United States on a uniform tariff of twenty cents for thirty words is simple moonshine, and cannot be done without taxation. The result would be a new burden on the entire people for the benefit of those who used the wires. For this, happily, the country is not ready nor at all inclined. Hungry lines alone would be glad to see the scheme succeed, so as to realize from investments which are found to be remarkably poor and unremunerative.

Executive Order No. 96.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
DECEMBER 27, 1869.

All "franks" issued by this Company for the year 1869, are hereby continued in force until the 15th day of January, 1870.

GEORGE WALKER, Vice-President.

◆

Executive Order No. 97.

REDUCTION OF TARIFF ON CUBA BUSINESS.

DECEMBER 27, 1869.

On and after January 1, 1870, the tariff in gold to Havana will be as follows:

From any office in the United States, east of the Mississippi river, including St. Louis, Mo., five (5) dollars for ten (10) words or less, and forty (40) cents for each additional word. From any office west of the Mississippi river, excepting St. Louis, Mo., seven (7) dollars and fifty (50) cents for ten (10) words or less, and seventy-five (75) cents for each additional word. From any offices in the Provinces of Nova Scotia and New Brunswick, six (6) dollars for ten (10) words or less, and fifty (50) cents for each additional word. The address, date and signature must be counted and charged for, and tariff collected in gold as heretofore. To places in Cuba, other than the City of Havana, the same additional charge in gold must be made as heretofore, viz.: For twenty (20) words or less, counting address, date and signature, seventy-five (75) cents.

For each additional ten (10) words, or fraction thereof, twenty-five (25) cents.

Rules for checking, counting, &c., remain unchanged. See Executive Order No. eighty (80) in JOURNAL of September 1, 1869.

GEORGE WALKER, Vice-President.

◆

International Ocean Telegraph Company.

THE annual election of directors of the International Ocean Telegraph Company, for the ensuing year, was held at the office of the Company, No. 86 Liberty street, Tuesday, December 8th, when the following gentlemen were elected;

Messrs. Wm. F. Smith, J. T. Sandford, Alex. Hamilton, Jr., E. S. Sandford, David H. Haight, Robert J. Livingston, J. A. Scrymser, O. K. King, Wm. G. Fargo.

At a meeting of the directors, held on Wednesday, the following were elected officers of the Company for the ensuing year:

Gen. Wm. F. Smith, President; J. T. Sandford, Vice-President; Jas. A. Scrymser, Secretary; and Thomas P. Bladen, Treasurer.

◆

Testimonial.

Mr. Henry W. Wynkoop, the efficient and popular manager of the Western Union Office at Crestline, Ohio, and his wife, were the recipients of an elegant silver tea set, on Christmas morning, a present from the operators in Crestline Office, as a testimonial of their regard for them, in their official and social relations. The recipients were taken by surprise, but were extremely gratified at this mark of good feeling.

◆

GEN. CADWALLADER WASHBURNE is an excellent man, and a capital Congressman—so good, indeed, that we are sorry to see him taking to moonshine. Let us give Gen. Washburne a little hint. Try your hand at managing the mails decently before clamoring for the telegraph. Abolish the robbery of the Franking Privilege, which makes the poor man's postage dear, before you pine for the more cumbrous telegraph system, in order to make the poor man's telegraphing cheap. While you persist in maintaining the Franking Privilege, do you suppose the country would dream of trusting you with the telegraphs? —*New York Tribune.*

TARIFF BUREAU.

Semi-Monthly Circular.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
JANUARY 1, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since December 15, the date of the last tariff order. Please note them in your tariff book:

NEW OFFICES.

241 Archibald, O.
Brookeville, Ks., tariff same as Ellsworth, Ks.
Columbus, Neb., formerly an Other Line Office, 75 cents more than Omaha, Neb.
436 Creston, Iowa.
Duanesburgh, N. Y., tariff same as Knowersville, N. Y. See JOURNAL of October 15.
Eagle Tail, Ks., 10 cents more than Sheridan, Ks.
* Evans, Col.
21 Jamaica Plains, Mass.
379 Leesburg, Mo.
437 Lecygnes, Ks.
379 Moselle, Mo.
290 Marco, Ind.
328 Mt. Vernon, Ill.
418 Mooresville, Mo.
47 Medford, N. J.
* Peru, N. Y.
211 Petersburgh, Mich.
* Richmond, Utah.
254 Richmond Junc., Ky.
399 Richland, Mo.
* Snow Shoe City, Pa.
290 Switz City, Ind.
288 Washington Heights, Ill.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.	*Leaves this Line.*
Evans, Col., . . .	100 †	Cheyenne, Wy.
Peru, N. Y., same as Plattsburg, N. Y.		
Richmond, Utah, .	60 †	Salt Lake City, Utah.
Snow Shoe City, Pa., .	25 2	Bellefonte, Pa.

† Each additional five words or less 20c.

OFFICES CLOSED.

Beverly, O.

Charlotte, N. Y., for the season.

Milford, Pa., business for Milford will hereafter be delivered from Port Jervis.

Pond Creek, Ks., and Rock Springs, Ks.

TO OFFICES HAVING "SPECIAL SHEET A."

Hereafter offices not already notified of change in tariff to Kokomo, Ind., will make rate to that office same as "special rate" to Indianapolis, Ind.

GENERAL INFORMATION.

Business for Millersburgh, Holmes Co., O., and Fredericksburgh, Wayne Co., O., is forwarded by mail from Orrville, O., check the latter office on such business, and collect 5 cents for postage.

Hereafter business for the following named offices will be checked as indicated herewith:

Clarksville or Spruce Run, N. J., check Plainfield, N. J.
Mt. Clair, Md., check Camden Station, Baltimore, Md.
Newmarket, N. H., check direct.
North Vineland, N. J., check Vineland, N. J.
Newmarket, N. J., check Plainfield, N. J.
Pamrapo or Saltersville, N. J., check Elizabeth, N. J.
Pomona, N. J., check Absecom, N. J.
Raymond, N. H., check Newmarket Junction, N. H.
South Newmarket, N. H., check Newmarket, N. H.

Offices in District F should check Scranton, Pa., on business for Archbald, Olyphant and Providence, Pa. "Tariff for Other Lines" 20 and 2.

Hamilton, Mo., incorrectly given in the tariff book as in square 339 should be entered as follows:

437 Hamilton, Caldwell Co., Mo.

JOURNAL of Oct., 15th, gives Blair, Iowa, with tariff from Mo. Valley Junction, Iowa. It should read Blair, Neb., &c.

The tariff to Baldwin, Fla., Other Line office, is 50 and 5 from Lake City. It was printed in last JOURNAL 100 and 5.

The rate for Other Lines from Lake City, Fla., to Key West, Fla., will hereafter be 400 and 25.

The following modification of Executive Order No. 80, relating to Atlantic Cable business, will go into effect January 1st:

F. O. B. and C. F. I. when written as separate letters are each counted as three words, but when written fob, cfi, as one word.

WILLIAM ORTON, President.

Telegraphers' Mutual Life Insurance Association.

ASSESSMENT NO. 10.

R. L. Guion,
A. W. Gordon,
Will. S. Clark,
Waldo H. Collins,
H. Frank Thurber,
James Murray, 9 and 11,
James P. McKinstry,
Taylor L. Brown,
F. R. Dewey,
Fred. S. Smith,
J. S. Hunter,
Bennet A. Pryor, No. 11,
J. A. Wright,
J. H. Presley,
W. Arnoux,
Martin Barth,
George W. Roberts,
George Farrell,
Richard W. Marriott,
M. H. Redding,
John B. Page,
Robert Cunningham,
D. T. Francis,
J. P. Golden,
O. C. Harrell, 9 & 10,
John H. Pearce,
T. H. Miles,
W. W. Kelchner,
J. B. Leach,
P. Collins,
Thomas A. Davis,
F. T. Smith,
F. A. Eyster,
Madison Buell,
D. H. French,
Louis Maury,
Myron O. Morgan,
W. H. Champlin,
W. R. Dulin,
D. H. Fitch,
G. W. Dyer,
A. J. Stoddard,
H. A. Tuttle,
Charles A. Lieb,
Edwin Everts,
John Fuller,
D. A. Van Ham,
Nelson H. Browne,
T. R. Knox,
O. S. Conklin,
H. L. Gramsow,
Ira A. Manley.

The Case of Thomas T. Gage.

YARMOUTHPORT, MASS., Dec. 24th, 1869.

EDITOR JOURNAL OF THE TELEGRAPH:

Will you do me the favor through the columns of your paper, to convey to the officers and members of the Telegraph Mutual Life Assurance Association my profound appreciation and hearty thanks for the generous gift of one hundred dollars, which is all the more gratefully acknowledged, from the fact that my son, Thomas T. Page, late operator at Yarmouthport, Mass., through ineligibility at the time of application, and his long continued sickness, could not become a member of your Association, and therefore was not entitled to its benefits.

Also to the employees of the 5th District, and to Mr. Charles F. Wood, Superintendent, for the additional sum of one hundred and nine dollars, which in consideration of the fact that my son must have been personally unknown to many of the contributors, is a striking instance of the brotherly feeling and generosity which seem to be marked characteristics of the telegraph fraternity.

I am, sir, gratefully yours,
MRS. D. H. GAGE.

The case of Mr. Gage, to which reference is made above, has been a painful one to the Executive Committee and especially so to the Treasurer. Mr. Gage applied for membership two or three weeks prior to his death, being at the time unable to attend to the duties of his office, as admitted in his application. The committee would have gladly accepted him could they have consulted their own feelings only, but the Treasurer declined the application as one which he was not at liberty to accept. After the rejection it was represented by one, supposed, to be intimate with Mr. Gage, that his sickness was notional, and that he was entirely eligible. On this statement a certificate was issued, Mr. Gage's decease taking place immediately thereafter. Under such circumstances the committee felt that an assessment could not justly be ordered, and voted Mr. Gage's heirs one hundred dollars from the expense fund, with an urgent appeal to the District Superintendent to use his influence to increase that sum by subscription. This Mr. Wood, with his usual kindness and promptness did, with the result as stated. If there is any blame to be laid on any one for the course pursued, it must be laid on the Treasurer who rejected the application because the applicant was unable, as required by the rules, to perform official duties, and who should have adhered to that decision.

Our Christmas Turkey.

WE are happy to acknowledge the receipt of a handsome and well favored turkey from our friend John Campbell, of Carlisle, Pa. May his shadow never be less.

Preservation of Telegraph Poles.

M. Delarge.—The preservation of the large number of wooden poles in use for carrying the conducting wires has become a very important subject. The author reviews the use of the following substances employed for the purpose: *Sulphate of copper.*—On inspection of a large number of poles treated with this substance, it was found that, notwithstanding nearly twenty years' service, the wood was in a very excellent state of preservation; but it should be added that very much depends upon the kind of timber used for the purpose, and upon the period of the year when it is cut down. Creosote is very extensively applied, and, according to a series of comparative experiments, purposely instituted in Belgium, during the years 1861 and 1862, the durability of creosoted timber is considered equal to that treated with sulphate of copper. Creosote, however, is found to be, in many instances, very inconvenient, both on account of the odor it emits, and on account of the injury caused by its corrosive action upon the hands of the workmen. *Chloride of zinc.*—According to the experience of the Netherlands officers of the Waterstaat, to whom is confided the material of the telegraphic lines of that kingdom, the use of chloride of zinc has given great satisfaction in the sandy soils of Gelderland; whereas in more calcareous soils, chloride of zinc did not answer the purpose at all, a result also observed in Germany. According to the author, there is a good deal of practical experience yet to be gained in this department of chemical engineering, since every day more and more proves that the nature and qualities of the soil wherein the poles and other timber, railway sleepers, &c., are placed, has a vast deal more to do with the preservation of the wood than could be, *a priori*, conjectured.

A Cash Debt Due Inventors.

We do owe them much, not merely a debt of sentimental gratitude, but a debt payable in cash, which shall lift them above want, and place them upon such a pinnacle of happiness that the world shall say, "Thus shall it be done unto the man whom the nation delighted to honor!" How shall we give pecuniary consideration for inventions? There are two ways in which this might be done. One is by the purchase, for cash, by the Government of all inventions, for the use of the nation. This plan is met at the outset by the impossibility of determining the value. Every inventor supposes himself to have a fortune in every conception that he puts into wood and iron. Stealing tremblingly and furtively up the steps of the Patent Office, with his model carefully concealed under his coat, lest some sharper shall see it and rob him of his darling thought, he hopes to come down those steps with the precious parchment that shall insure him a present competency and that shall enrich his children. I should think if he were offered a million, in the first flush of his triumph, that he would hesitate about touching it without sleeping over it for a night. Yet fourteen thousand millions would be a pretty heavy bill to pay from a treasury not over full. Fourteen hundred millions might be thought an important addition to the national debt, or even one million four hundred thousand, which would be just $100 a piece for all the patented inventions of 1869. I think, therefore, that we may set aside the plan of purchase as impracticable.—*Commissioners of Patents.*

A New Telegraphic Line from the City of Mexico to Toluca.

We are in receipt of the following dispatch, announcing the completion of the telegraphic line between the City of Mexico and Toluca:

Recibido de Toluca el 23 de Noviembre de 1869, a la una y 22 minutos de la manana.

Senor D. G. W. CLARKE:

Tengo el honor de poner a su disposicion la linea. Manana estara en esa. JACOBO CAMPBELL.

The enterprise of Mr. Campbell in thus energetically pushing, against many difficulties, this line through to Toluca, is deserving of all credit, and places that gentleman and his line favorably before the Government and the Mexican public.—*The Two Republics.*

We are glad to hear from our old friend "Jake" again. It is many years since he and we pulled together over the old Pennsylvania Railroad, and ate corn dodgers in his tent in the piney woods of Mississippi. There never breathed a more genial, willing, faithful, soul. There was no tire in him, and no baulk. He could climb a pole like a squirrel and leap on a railroad car at full speed. He always landed on his feet and never had a bad word to say of any body. Such men should live long. We are glad he is successful, but he never spoke to us in the language he sends to Senor Clarke. He may talk Spanish now but he is clear Yankee Dutch, and not a bit of waste material about him.

Jake! Our bones to you! God bless you!

Simple Experiment Showing that Air Possesses Weight.

Heat a little water in a flask, until the air is purged out, and, while in this state, cork tightly, and set aside to cool. When cool, balance carefully in a good balance, or even ordinary scales; then remove the cork to admit air, and again weigh (including cork): the additional weight of air admitted into the flask, will be sufficient to sensibly turn the scale.

◆

THE use of the back adjusting screw of the key arm with an anvil underneath to accomplish the purpose of open circuit writing, as proposed to us by Mr. C. R. Richards, of Charlemont, Mass., is an easy way of adapting Mr. Frey's mode to the keys now in use, and which Mr. Frey has himself previously employed. This system, with Haven's mode of securing at all times a firm connection, would secure three very practical and desirable results.

1. Economy in local battery.
2. Freedom from open circuits.
3. A firm connection.

Married.

PETRICH—SCHULTZ.—In San Antonio, Texas, November 22, 1869, at St. Mary's Church, by Rev. Father Johnston, Mr. N. J. Petrich, of Mississippi, Western Union Telegraph Company, to Miss Lena Schultz, of San Antonio, Texas.

HILYARD—HOVEY.—On Tuesday, December 22, at the residence of the groom's father, by Rev. Wm. H. Elliott, Mr. Wm. F. Hilyard, Manager Western Union Office, Smyrna, Del., to Miss S. E. Hovey, all of Newcastle, Del.

ANDERSON—PINKNEY.—In Buffalo, Thursday, December 23, 1869, by Rev. J. Hazard Hartzell, Joe. Anderson, Jr., formerly of Newark, Ohio, to Miss Gertrude Pinkney, of Buffalo, N. Y.

Died.

In Cleveland, O., December 10, Ev. Hunt, aged 15 years and 8 months.

Journal of the Telegraph.

Our Telegraphic Machinists.

It is a source of great pleasure to us to know that all our well-known manufacturers of telegraph machinery enter the new year crowded with orders. The houses of L. G. Tillotson & Co., New York, and Bliss, Tillotson & Co., Chicago, have on a full complement of hands chiefly employed in the manufacture of telegraphic registers and magnets, and in a new and promising system of fire alarms. On a recent visit to the works of this company in New York, we were surprised at the number of men engaged, and the activity manifest. As we have before stated, these works are under the charge of Mr. E. M. Pierson, a man of much push, ability and skill, and to whom we are indebted for personal courtesies. The foreman, Mr. Redmond, is a genial, practical *man*, thoroughly up to his work and duties.

The Brothers Chester are equally under pressure, and have on hand the execution of immense contracts for fire alarms and scientific specialities, to which they are indebted to the fine mind and skill of the dark eyed brother who superintends the mechanical department, as well as to the energy and politeness of another brother who smiles *beneath* his glasses.

Mr. Brooks quietly pursues his manufacture of insulators in Philadelphia with increasing demand therefor. Certainly no insulator ever stood a more crucial test with such surprising results as those exhibited in the Silverton experiments, when the escape was as 5 to 3,600 of the best of English insulators. Prof. Morse, in his official report to the Government, states them to be extensively sought for on European lines.

We call attention to the advertisement of the new house of Gray & Barton in Chicago, whose increasing business has compelled already a change of quarters to rooms more spacious and convenient. The success of such establishments is marvelous. Our old friend Barton has at once placed himself in the van of manufacturers as he has always been in that of good men. We wish him abundant success. There is an odor of honesty about him which must secure him both friends and fortune.

We must delay further notices of this character until our next number. We wish all of you a happy and prosperous New Year.

◆

The Superiority of American Inventions in Europe.

I suppose that the foreign patents of American inventors, that have been copies of patents previously granted in this country, are the best that are granted abroad, and I know that many an English or French invention that has been patented without difficulty there, has been stopped in its passage through our office by a reference to some patent previously granted in this country, or perhaps in the very country of its origin. In spite of our examinations, which rejects over one-third of all the applications that are made, or, more properly, because of it, invention has been stimulated by the hope of protection; and nearly as many patents will issue in the United States this year as in the whole of Europe put together, including the British isles. But a few days ago I took up a volume of Italian patents to see what progress the new kingdom was making in invention, when I was amused and gratified to find on every page the name of the universal Yankee, re-patenting there his American invention, and, I suspect, much the best customer in the patent office of united Italy. The truth is, we are an inventive people.—*Samuel S. Fisher.*

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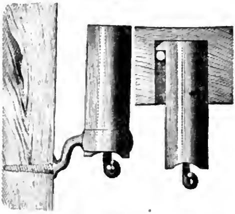

The guarantees of this insulator are:

1st. A current resistance in rain or fog, or in rain and fog, combined of 100,000,000,000 Ohmads.

2d. To insulate a conducting wire of any length in rain or fog or rain and fog combined, to its full working capacity, or the capacity of a similar wire or conductor placed upon any other insulators under the most favorable circumstances of weather.

3d. Strength, not to break or part by any strain by, or that a No. 8 wire will bear.

It is not injured by missiles in the general acceptance of the term.

It does not depreciate from exposure to smoke, soot and the gases from combustion to one hundredth part of the extent of ordinary insulators.

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JOHN POLHEMUS, Printer and Stationer, 102 Nassau Street, N. Y.

JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 4. NEW YORK, JANUARY 15, 1870. WHOLE NO. 53.

The Strike of the Telegraphers.

When the Western Union Telegraph operators attempt by a strike to obstruct even temporarily the business of the whole country, they should, at least, take care to be provided with a real grievance. Otherwise the public, which generally forms a pretty accurate judgment upon such matters, will not extend to them its sympathy, nor deem their action justified. The case as between the telegraphers and the company stands at present thus: The Protective League of the former say that the company reduced the salaries of certain operators at San Francisco, and that those who refused to submit to the reduction were discharged. And they require that the discharged men be reinstated at their old salaries, and that no reduction take place in any cases. This statement is clear and simple enough, but unfortunately, for the credit of the strikers, it rests on no basis of truth. General Palmer, the secretary of the company, distinctly disavows any knowledge of an intention to lower salaries, on his own part or that of Mr. Mumford, the agent at San Francisco. This latter gentleman, on being questioned by General Palmer, is as explicit. He says, in words susceptible of no misinterpretation, "I have reduced no salaries," and he adds that he has had "no intention of doing so." Two men were discharged for two reasons—they "were trying to make disturbance," and the force was unnecessarily large. And "the plea of a general reduction is without the slightest foundation as a matter of fact."

The league, in reply to these denials, simply express their disbelief of them, and reiterate the demand for restoration of the San Francisco discharged operators. But, in addition to this, they announce that various of their members at different points "have already suspended work," and it is demanded that these latter be reinstated in their former positions, the time lost by the strike being deducted from their month's pay. And on being refused these conditions, and assured that they had been imposed upon by some of the brethren in San Francisco, they declare the strike general.

This, without a word of exaggeration, is the whole story. There is but one inference possible to be drawn from it. The strike was evidently resolved upon by a few leaders, pretext or no pretext. A complaint that two men, who are not named, but who, we presume, will be, were dispensed with for what, as any person in his senses will agree, their employer had a right to consider good cause, is all the capital of fact the leaders had to work upon. It sufficed for their purpose. But are not the great body of the telegraphers thereby placed in a false position? Had the cause for a strike really existed, they might have claimed the public sympathy; no cause exists, however, and they simply are made to appear as a body of intelligent and respectable persons who are hoodwinked by false friends working in secret for their own private aims.—*N. Y. Times, Jan. 6.*

Embossed Paper Automatic Process.

(From Professor Morse's Report.)

The general advantage proposed to be obtained by automatic transmission is that a greater quantity of intelligence can be transmitted in a given time by this mechanical mode than by the ordinary or hand manipulation with the Morse key, or manipulator, and that this may be accomplished by having the dispatch, if of great length, set up or prepared by dividing it into what are called by printers "takes" or convenient portions, and employing several operators who, at the same time, prepare their several takes by setting up the type, or preparing the punched paper to be used in the transmission. The mode proposed by the writer of this report has the advantage of greater simplicity as a result of the embossing process with the *point seche.* For this mode requires no type setting, no new instrument for preparing the paper; no new process of punching paper to be learned by the operators. The operator prepares his dispatch in the usual way, by embossing the paper, as if sending a dispatch. It is then at once ready for transmission; needing no perforations nor other preparation. The paper strip with the embossed characters is simply passed beneath a delicate lever like that of the relay magnet. As every embossed part passes under the lever, contact is made longer or shorter according to the length of the embossed line. The result is the same as by the type process and the punched paper process.

The only variation which may possibly be required in the present Morse apparatus is a more perfect mechanical embossing point, a small wheel, for example, instead of a blunt point, by which the embossed characters shall receive a stronger and bolder relief, and paper more capable of this strong embossing.

These are within the ordinary mechanical capabilities of good workmanship.

Those who are familiar with the early history of the generic telegraph will recognize the fact that the automatic mode of recording was embodied in the first telegraphic instrument devised by the writer in 1832, and it was the first mode by which the new art was demonstrated in 1835. At that early period the automatic was deemed to be the only practical, if not practicable, mode of insuring a perfect record. The details of this process are to be found in the earliest specifications and descriptions and models of the Morse invention in the Patent Office at Washington, and the instrumentalities are very fully described and illustrated by diagrams in Vail's earliest work on the telegraph, published in 1845.

◆

THE U. S. S. Yantic is being fitted out in the most complete manner with sounding apparatus, and the necessary material for running a line of deep sea soundings, for a submarine telegraph cable which is to connect the West India Islands with South America, on the Eastern Coast, and which in time will have a branch to Aspinwall, and thence to Panama, and down the west coast of South America.

THE TELEGRAPHERS' PROTECTIVE LEAGUE.

THIS organization, commenced in the summer of 1866 by a few men aggrieved by the failure of the Western Union Telegraph Company to meet their expectations of employment and advancement, has since then extended itself, more or less, throughout the Union. It embraced, at the close of 1869, the maximum of the effective force of the cities of the Union. Many joined it who never dreamed of the vassalage it designed, and the measure of the obedience it demanded. They joined it as an act of companionship in labor. Introduction to its membership, however, was only by taking an oath which practically surrendered right of private judgment. Each man swore in the presence of his Maker to give up the management of his bodily service, at call, to the officers of the League. This, of course, was necessarily concealed from those to whom they offered their service as operators, and who compensated them therefor. This secret oath rendered the actual engagement of their labor to the company they served practically false. No company would have accepted such a service. It constituted a state of sheer and palpable deception. We are willing to presume that the majority never reflected on the vassalage and scope of the secret oath.

The oath taken by the members of the League is as follows:

OATH.

You do solemnly swear, in the presence of Almighty God and these witnesses, that you will make common cause with the members of this League; that, forsaking your allegiance to corporations and individuals, you will, if necessity requires it, place your time and services at the disposal of the officers of the Telegraphers' League, and reveal neither the names of officers nor members, nor the purposes of the society, so help you God.

The members also subscribe to the following pledge:—

I, A. B., do hereby acknowledge that having become a voluntary member of the Telegraphers' Protective League, and being made cognizant with its objects and intentions, I have bound myself by a solemn oath to bear true allegiance to the said League; and I do hereby pledge my sacred honor that I will aid in whatever manner may be required the advancement and protection of its members, and obey all such rules or orders as may be promulgated through the proper officers and sanctioned by the vote of the circuit of which I am a member.

Section three of article nine of the constitution also provides:—

It shall be the duty of every member of the League to perform his whole duty to his employer *provided he does not thereby conflict with a duly authorized order from the chief operator of the circuit to which he belongs.*

Section five provides:

No member shall be at liberty to leave his regular duties to operate in any other town or city, under orders from any telegraph company, without having first received permission from the Chief Operator.

Does any one believe that a company with any self-respect would accept service predicated on such conditions as these? Could a man of truth engage himself to labor and conceal the fact of this prior and controlling engagement? It stultifies, to our mind, all idea of honor. We cannot comprehend it. Its utter folly, not to say baseness, gave the organization the means of mischief, without that element of righteousness which alone gives dignity in the use of power, as well as power itself.

As has justly been said by Mr. Cornell in a letter to the New York *Tribune:*

"Here are obligations, oaths and pledges subscribed and sworn to by the members of this secret League, which conflict with the faithful performance of an operator's duty to his employers and the public. They cannot be complied with by the operators of any Telegraph Company without destroying all the legal and legitimate authority of such company over its business.

"The welfare and public interests of the country demand that the telegraph business shall be conducted by responsible companies, and not by secret irresponsible leagues. Yours respectfully, EZRA CORNELL."

THE STRIKE.

For several months prior to the opening of the present year, every means had been taken to encourage and foment discord by elements entirely outside of the Western Union Telegraph Company, yet working within it. The process was profitable to them. So every insult to authority, every anonymous dagger, every arrow shot by discontent or impatience against an officer, was welcomed and used. The success of the Franklin line strike, promoted by the same parties, was the assurance of victory in one more extensive. It was determined on long before the cause existed which became the bald plea for its precipitation. It only waited some note of discontent to burst. That note came from San Francisco, January 1st, by a message in cypher, notifying the League officers in the East that the company had commenced the systematic reduction of salaries, and had dismissed two members of the League for resistance. With Western-like impetuosity, the Leaguers at Cincinnati and Chicago at once left their offices. There was no attempt at explanation, no effort to ascertain the truth of the statement on which this action was founded. There was no regard paid to the position occupied by telegraph men as the medium of the intercourse of society, which thus became a sacred trust in their hands. It had the whole aspect of a mutiny, pre-arranged and anxious for a trial of strength. It was not the action of a trades union, holding their meetings in open session and manfully canvassing their claims. It was a secret conspiracy sprung upon the public, by which the wheels of commerce and communication were attempted to be stopped without a cause, and with not a single intelligent effort to mitigate or prevent its possible consequences. We are willing to charge it to young blood, and not to the design of ruin; but the public, which was in greater jeopardy than the company, call it by a harder name.

NEW YORK.

On January 3d, the action of the two Western offices having been communicated to Ralph W. Pope, Grand Head Centre, at New York, a man entirely disconnected with the operators of the Western Union Telegraph Company, he convened a meeting of the members of the League, at which resistance was at once determined, and a committee appointed to wait upon the executive officers of the company.

THE CONFERENCE.

Messrs. W. W. Burhans, C. J. Ryan, and J. M. Peters, having been appointed a committee to notify the executive officers of the Western Union Telegraph Company, that the members of the Telegraphers League, in New York and throughout the country, would refuse to work unless the company at once restored the salaries which had been reduced and returned the dismissed men at San Francisco to their former amounts and positions, presented the following letter to Mr. Palmer, Secretary:

NEW YORK, Jan. 4, 1870.

O. H. PALMER, *Secretary*,
or the Executive Committee Western Union Telegraph Company.

SIRS,—At a meeting of telegraphers, held in this city last evening, the following resolutions were unanimously adopted:

Resolved, That a committee of three be appointed to wait upon the executive committee of the Western Union Telegraph Company, informing them that they are members of a Protective Association of Telegraphers, extending as far west as San Francisco, Cal., and that members of our association there inform us that the company have reduced their salaries at that point, and that they ask members everywhere to aid them in preventing this reduction.

Resolved, That this committee be instructed to request that the salaries of members at that point, San Francisco, Cal., be not reduced, and that those operators who have been discharged for refusing to submit to this reduction be reinstated.

That in case the Executive Committee return an unfavorable answer to our committee, then we request the Grand Chief Operator of the Telegraphers' Protective League to order all members of our organization to aid our brethren in San Francisco in the only way possible, by immediately suspending work.

And it is further Resolved, That the committee be instructed to report to the Grand Chief the result of such interview by or before 3 o'clock, P. M., January 4, 1870.

Respectfully yours,
W. W. BURHANS,
C. J. RYAN,
J. M. PETERS,
Committee.

MR. PALMER'S REPLY.

EXECUTIVE OFFICE, W. U. TELEGRAPH,
145 BROADWAY, NEW YORK, Jan. 4, 1870.

Messrs. W. W. Burhans, C. J. Ryan, and J. M. Peters, Committee:—

GENTLEMEN—Your communication of this morning has been received, in which you state, in the form of a resolution, that the members of your association have been informed that this company have reduced the salaries of certain operators at San Francisco, and that the members of your association at San Francisco ask the members everywhere to aid them in preventing this reduction, and in which you ask that the salaries of members at that point be not reduced, and that the operators there, who have been discharged for refusing to submit to this reduction be reinstated, and in which you also state that in case the executive committee of this company return an unfavorable answer to you, that the Grand Chief operator of the Telegraph Protective League be requested to order all members of your organization to aid your brethren in San Francisco by immediately suspending work.

In reply I have to state that no salaries of operators in San Francisco or elsewhere have been reduced, and that your information is without foundation in fact. When your Mr. Burhans called upon me yesterday I stated to him, verbally, that he must be laboring under a mistake, as there had been no intimation given to this office of any contemplated reduction of salaries, and at his request I asked Mr. Mumford, our agent at San Francisco, to state the facts. I give his message in reply to such inquiry, in which he states as follows:—

"I have reduced no salaries here nor anywhere else, and have had no intention of doing so. Two men were discharged in San Francisco, because I was satisfied that they were trying to create dissatisfaction and make mischief, and because the force in the office was larger than was necessary to do our business. The plea of a general reduction is without the slightest foundation as matter of fact. The only changes made were increases, not reductions, and the salaries are as high as ever have been paid before."

I rely with implicit confidence upon the truth of this statement, and the action of this company will be governed accordingly. We can permit no combination nor organization of men to dictate to us who or how many persons we shall employ for the transaction of our business. We approve the action of Mr. Mumford.

Very respectfully, &c.,
O. H. PALMER.

The following is the reply of the Committee:—

NEW YORK, Jan, 1870.

O. H. PALMER, Secretary:—

SIR—We have received your communication in answer to ours presented to you this morning, in which you assure us, on the authority of Superintendent Mumford, that the grievances do not exist, that no salaries have been reduced at San Francisco nor any members discharged for refusing to submit to reduction of salary, &c. In reply we would state that officers and members of our organization at various points, believing that the grievances complained of by the San Francisco members do exist, have already suspended work. Officers and members at other points are now waiting for this committee to report and decide what action they shall take. We, therefore, propose that you instruct Superintendent Mumford to, or assure us that you will reinstate those members at San Francisco, if any, who have been discharged for refusing to submit to a reduction of salary, and that members who have already stopped work at various points be reinstated in their former positions at the same salaries as heretofore, and that their salaries for the time lost while on strike be deducted from this month's pay.

If this proposition is agreed to, then this committee assure you that the various points will resume their duties at once, and members at other points who are waiting to hear results of our negotiations. You will be promptly notified that the difficulty has been amicably settled.

If this proposition is not acceded to, the committee will feel constrained that the negotiations have been very unsatisfactory, and to recommend that the Grand Chief Operator of our organization take action in accordance with the instructions presented to you this morning. We are compelled by those resolutions to request a reply to this by or before three P. M. to day.

W. W. BURHANS,
C. J. RYAN,
J. M. PETERS.
Committee.

To which Mr. Palmer replied:

GENTLEMEN—I am in receipt of your reply to my communication of this morning, in which you propose, first, that we instruct Superintendent Mumford or assure you in writing that he will reinstate such members of your association as have been discharged at San Francisco for refusing to submit to reduction of salary; and, second, that members who have already stopped work at various points be restored to their former positions.

In respect to the first proposition we have already assured you that there has been no reduction of salary. I can, therefore, issue no instructions to Mr. Mumford upon the suppositions suggested by you. In respect to your second proposition I have no reports from superintendents in respect to operators who have left our service or what arrangements have been made for supplying the places of any who may have left the service. Without such information, without the knowledge of the facts, I cannot in advance determine what action may be right, or what may be due to new operators engaged, or to those whose places it has been necessary to supply.

When such questions are presented in the usual way, they will be considered in the same just and liberal spirit which this company has always manifested in its dealings with its employes.

I am satisfied, from the perusal of your two communications, that you have been grossly imposed upon by representations of one or two of your members in California, and that your alleged grievance is without foundation in fact, and I am surprised that after the positive assurance given by me in my communication of this morning, that your organization did not at once concede the fact and resent the imposition practised upon you.

Very respectfully,
O. H. PALMER.

It thus appears that the whole story sprang from the dismissal of two men who were obnoxious to the discipline and effectiveness of the San Francisco office, who revenged themselves by a false statement of the facts of their dismissal. The general reduction of salaries claimed to have been inaugurated was false. None was designed anywhere. None had been attempted at San Francisco.

THE YOUNG GUARD.

It was somewhat amusing, had it not been sad, to see three or four young men patroling the pavement in front of the office, 145 Broadway, on the cold morning of January 5, waylaying the operators as they came to duty, and urging them to join the strike. As we looked through at the movement, one bright young fellow noticing us, with an ominous toss of the head and a slap on the left breast gave us to understand that it was "war to the knife," and that there was infinite courage beneath his waistcoat. No doubt he thought he was "standing by his friends." Yet we thought he looked longingly at the comfortable stove beside which we surveyed him. At other corners similar patrols were stationed.

After Mr. Palmer's letter, and in the receipt of salaries acknowledged by themselves to be fair and liberal, it seems beyond belief that the following circular could have been issued. It could only be explained on the ground that finding that they had done wrong, and the company disposed to dispense with them, they desired to make the ruin as broad as was possible.

To all Members of the Telegrapher's Protective League.—The hour has arrived when prompt and united action is to decide the future welfare of the fraternity. The reduction of salaries which has been attempted at San Francisco is, we believe, but the forerunner of similar action, to be taken throughout the country, should it be found that we were willing to submit. The organization which has inaugurated this resistance extends from the Atlantic to the Pacific, from the Great Lake to the Gulf. We have used every honorable effort with the Executive Committee to end the strife by reinstating our brethren at their old salaries. The authorities, by refusing to do so, have expressed their determination to crush us. The issue now is the life of the League, as well as to sustain our San Francisco brethren. We accept the challenge cheerfully, believing that success will follow this first effort to maintain our rights. We control all the important telegraphic points in the United States. We only ask of our brother operators outside of the organization not to come in and fill our places. It will merely prolong the contest without changing the result. With renewed confidence in the justice of our cause, the operators of the North, East and South to-day join hands with their brethren of the West, determined that we will be men, even while laboring for a gigantic corporation.

R. W. Pope, Chief Operator.
R. T. Hutchinson, Assistant.
W. W. Burhans, Grand Secretary, T. P. L.

With the issue of this notice, for the circulation of which the wires of the company were freely used, about sixty persons, including a few lady operators, left the Central Office, 145 Broadway, on the afternoon of January 4th, in which they were joined by almost the entire force of the offices at Philadelphia, Baltimore, Washington, Pittsburgh, Albany, Troy, Boston, Poughkeepsie, and other cities. Eight printing operators, and about four operators who refused to join the league, and the managers, were all that were left to perform the duties of the central office. Many messages had been left on file unsent. But we looked in vain for any signs of discouragement. It was a mutiny which had to be met, and was met bravely. The leaguers had scarcely left the building before a portion of the large operating room was under thorough cleansing, and in an hour or two, a corps of able lady operators, under the direction of Miss Snow, took possession of some of the leading wires. Messrs. Downer and Dolan arranged the remaining force to the best advantage, and every message was dispatched before midnight.

At other offices, equally, energy was shown: one office only showed the white feather. Manager W. C. Buell, of Troy, joined the office force, and practically closed his office. The same evening however it was in other hands, and in two days was fully manned. Mr. Jones, at Albany, stood firm; Managers Tinker, at Washington; Wilson, at Baltimore; Gibson, at Pittsburg; Armstrong, at Cincinnati; Hucker, at Buffalo; Milliken, at Boston; Merrihew, at Philadelphia, all worked nobly at their posts.

During the entire day of January 5th, the officers were under the most anxious watch for the development of the scheme. By the morning of January 6th however it was evident the worst was past, and by the night of the 7th the failure of the strike was certain. Gen. Stager announced the whole of the Grand Central Division from Buffalo west, intact.

The following we preserve as reminiscences of this movement, which, with more thorough organization, or less vigorous management on the part of the Telegraph Company, might have been disastrous.

REPORTS TO THE WESTERN UNION COMPANY.

Chicago, Ill., Jan. 4, 1870.

Prominent representatives of the press, business men, and railroad officials have called upon the Western Union Telegraph authorities at Chicago, and volunteered their cordial support in maintaining their position towards the strikers. The railroad companies not only afford them the assistance of their own operators until they can permanently fill the vacancies, but will close their offices, if necessary, until such time as they can conduct their business unmolested.

Cincinnati, Ohio, Jan. 4, 1870.

There is no particular change in the telegrapher operators' strike. The operators held a meeting this morning, and received dispatches from other points. The officers of the telegraph company here have confidence in their ability to maintain their position, and continue to attend to all business.

Pittsburgh, Pa., Jan. 4, 1870.

The telegraph operators of the Western Union office in this city left their instruments at half-past nine this morning. The officers of the company have secured operators enough to do the business as usual in the main office.

THE ALLEGED CAUSE OF THE STRIKE IN SAN FRANCISCO.

San Francisco, Jan. 4, 1870.

The statement that there is a general strike here of Western Union Telegraph operators, in consequence of an alleged attempt to reduce salaries is not true. No reduction of salaries has been made, attempted, or contemplated. Two operators have been dismissed, because their services were no longer required, but no offer of reduced compensation had been made to them. These dismissed employes appear to have misrepresented the case at the East, with a view to revenging their discharge. Their former associates here do not sympathise with them, nor join their movement, and business is going forward promptly as usual.

Of course, this movement caused great excitement, and interrupted public business to a serious extent. The public demanded full information of its cause. The public press, except the New York *Herald*, denounced the movement as utterly without public sympathy, and the following card was issued January 7th.

The Company promulgated the following last evening:

Executive Office Western Union Telegraph Company,
New York, Jan. 5, 1870.

To the Public: The interruption of the business of this Company by a strike among its operators is a matter of such general interest to the people of all sections, as to call for an explanation on the part of its executive officers. The first intimation of difficulty reached this office Monday morning, when persons styling themselves "A Committee of the Telegraph Protective League," called to complain that certain operators in San Francisco, members of their organization, had been discharged because they would not submit to a reduction of salary, and demanded that these men should be restored to their former places and pay. They were told that the Company had no knowledge of any reduction of salaries at San Francisco or elsewhere, but that inquiry into the facts would be made of the manager at San Francisco. The reply of Mr. Mumford to this inquiry stated that he had discharged two men at San Francisco for trying to create dissatisfaction in the office, and because the operative force at that point was larger than was needed, but that no reduction of salaries had been made or contemplated, the only changes having been by way of increase. This reply was communicated to the operators' committee, who had meantime presented to the officers of the Company a copy of resolutions purporting to have been adopted by the so-called League, demanding the restoration of the men in question, and threatening a suspension of work on the part of its members if the demand was not complied with. Not satisfied with the explicit denial by the Company of the facts on which their action had been based, the operators in a second letter demanded of the Company a pledge to restore such operators at San Francisco, if any, as had been dismissed for resisting a reduction of salary, and also to reinstate in their former places and pay the operators who had left the Company's service in several of the Western cities, at the call of their disaffected friends in California. With neither of these demands could the Company comply. It would have been a gratuitous insult to a faithful officer to send him instructions based upon a state of facts of which he had denied the existence, while on the other hand, the executive officers could not stipulate in advance to restore to their places and pay persons who had left their employ without a shadow of reason, and in a manner and for the purpose of embarrassing the Company's business (as was avowed in the resolution adopted at the operators' meeting), and whose places had perhaps been supplied by new engagements. Such pledge would have interfered unjustifiably with the functions of Division and District Superintendents, and would have involved the violation of our contracts with innocent parties. With this the correspondence ended and the strike followed, both in this and in other principal cities. The officers of the Company deeply regret the inconvenience which this movement will occasion to its customers, not to speak of the injury which it will cause to all parties and interests affected by it. The action of the operators has been caused by mistake, and they have permitted themselves to be imposed upon by undeserving men who had no real grievances to complain of. In spite of the very large reduction in tolls which have been made by the Western Union Company within the last three months, no reductions in the pay of its employes have been made or contemplated. The course pursued by the operators is, therefore, ungenerous as it is unjust. The Company can only account for such actions on the part of an intelligent body of men, and many of whom have been for years in its service under the most cordial relations, by the fact that they seem to have surrendered their individual liberty and the right of private judgment, which most Americans value so highly, to become the fractional instrument of an irresponsible body. Of the existence and purposes of the Telegraphers' Protective League the officers of this Company had no knowledge previous to the present disturbance. They are now informed that its members bind themselves by a sacred oath to obey the orders of its officers. Such an order appears in the journals of this morning over the signatures of three persons, the chief of whom is the city manager of another telegraph company. Thus it appears that the employes of the Western Union Telegraph Company, by joining an organization thus officered, have put themselves in the situation of an army which by solemn and secret conspiracy, should bind itself to lay down its arms and surrender its cause, at the bidding of and upon the signal of the commander of the enemy's forces. But the cause cannot be thus surrendered. Fortunately for all concerned enough loyal men remain to command the situation, and to serve as a nucleus to raw recruits. Such is the present situation of this Company. It has force enough at this and all other important points to do the business which shall be brought to it, and the numbers are increasing as rapidly as they can be put to work. With forbearance and co-operation on the part of those whose interests it seeks to subserve, things will speedily right themselves, and the justice of the Company's position will be vindicated.

O. H. Palmer, Treasurer.

Alonzo B. Cornell,
George Walker, } Vice-Presidents.

THE STRIKERS IN COUNCIL.

During all this time the strikers in New York were holding daily sessions, the proceedings of which were partially published in the daily papers of the city. Dispatches of encouragement came from all parts of the country, inciting the strikers to perseverance and courage. Some of these were full of fire and triumph. One of these we give as a specimen :

THE TELEGRAPH STRIKE—CAPITAL SUPPORTS THE STRIKERS.

PITTSBURG, January 6.

The oil merchants of this city and those of the entire section known as the oil regions have resolved to withdraw their patronage from the Western Union Telegraph Company. The operators have the undivided sympathy of the business men here, and it is rumored that the latter will soon give public expression in favor of the demands of the operators being acceded to, and which shall be most unmistakable in language, to be followed, if necessary, by future action which shall work the death of the great monopoly!

Here is another :

TO STRIKERS.

WASHINGTON, January 6.

Now in session. Forty members present. Hon. H. W. Lathan, President of the Labor Association of the United States, visited the meeting by invitation, and made an address. His address was enthusiastically received. We have sworn to stand firm to the death, and we mean business. All we ask is that our brethren throughout the country stand with us.

(Signed) JARVIS, DYER, KIRBY, } Committee.

A third is as follows :

NEW YORK, January 6, 1870.

To R. W. POPE, G. C. O., Telegraphers' Protective League.

SIR: By resolution of the Executive Committee of the National Telegraphic Union, adopted January 5th, inst., two hundred dollars of the fund remaining in the treasury of the Union is appropriated, if needed, to sustain the cause of right and justice in the pending difficulty between the managers of the Western Union Company and its employes.

The draft of the proper officer of your organization upon Mr. A. L. Whipple, the Treasurer of the Union, will be approved by the President, Mr. W. H. Young, and paid at sight.

Respectfully yours,
F. L. POPE, Cor. Sec.

BOSTON, January 5.

To R. W. POPE, N. Y.:

The manager of the Ladies' Department, Western Union Telegraph Company, and all the ladies, have joined us this morning. Don't budge an inch.

H. W. WHEELER.

CINCINNATI, O., January 5.

R. W. POPE:

We are firm and confident.

STINE.

INDIANAPOLIS, Ind., January 5.

R. W. POPE, N. Y.:

We stand firm and will never yield an inch.

FULLER.

WASHINGTON, D. C., January 5.

To R. W. POPE, N. Y.:

We cling like ivy to the wall,
Will together stand or fall.

ROYCE.

At the close of a meeting of the League, held in Grand street, New York, the chairman thus closed the proceedings :

The chairman, Mr. R. N. Hutchinson, before closing the meeting, stated that he did not see how the prospect could look any better. General Eckert would find some things could be done as well as others. We must stand out to the last, and no power on earth could make him touch a key until he saw every one of his brethren reinstated in their old positions.

The Telegraphers' Protective Association issued the following card :

TO THE PUBLIC: The Telegraphers' Protective League claim that the cause of the strike has been entirely misrepresented by the officers of the Western Union Telegraph Company; that they (the telegraphers) are not on the offensive, but on the defensive; that three operators' salaries were reduced 25 per cent. in the San Francisco office, and also salaries of eight operators in the Sacramento office, who, upon their refusal to the reduction, were discharged, upon which the operatives of those offices abandoned their instruments, and communicated their grievances and action to their fellow operatives in the East, who all, to a man, have stopped work, and do not propose to return to work until justice is done to their brethren on the Pacific coast, where the reduction of salaries first commenced. This is the true cause of the telegraphic strike, all statements of the monopolists to the contrary notwithstanding.

CARD FROM J. W. SIMONTON, PRESS AGENT.

Having examined with care the private cypher correspondence between the officers of the Western Union Telegraph Company in this city and Mr. Geo. H. Mumford, the General Agent in charge in California, I think it is quite clear that the pending strike among the telegraph operators is the result of a bold conspiracy by designing parties to avail of the organization known as the Telegraphers' Protective League, to precipitate controversy between the Company and its employes upon fictitious grounds. This theory is sustained by a private telegram, which I have received from San Francisco, announcing that the trouble originated in that city, not among the old employes of the Company, but with new comers from the East. The result, probably, will prove that these new comers were sent to California for the express purpose of starting the difficulty at that distant point, knowing that it would require seven days to get full mail advices from thence, and assuming that in the meantime the great body of operators would strike—at the order of their secret officers—and thus become compromised long before the tricks of which they had been made the dupes could be exposed. So much of press and public inconvenience is involved in the pending issue that the essential facts bearing on the case are worth your attention; and here they are, on the word of Mr. Mumford, who I know to be incapable of falsehood. Salaries of telegraph operators are graded according to their respective ability, experience, and skill. Some time last month Mr. Mumford proposed to reduce the salaries of two men $5 per month each, and to increase that of a superior operator $20 per month, thus adding to the aggregate pay roll just when material reductions had been made in rates to the public. The operators, in response, preferred a respectful request that salaries be readjusted according to a scale which they presented. The scale left the old salaries as they were, except in a few instances, where an increase was asked. Mr. Mumford assented to the schedule, so far as to grant, in several cases, part of the increase suggested, leaving other salaries as before. This entirely withdrew the proposition to reduce two salaries by $5 each. But the force on hand being larger than was required, in the opinion of the Superintendent (concurred in by the operators generally), two men were dismissed *for that reason only*. Probably those men were selected for dismissal who had been found least trustworthy for the service of the company. Another operator who had demanded an increase of $20 per month, and who had been allowed $10 more than he ever had received before, declined to work at the advance named, and thus dismissed himself. Here is the simple origin of the trouble. The strike is essentially one for an increase of $10 per month in the salary of one man who was already offered just $10 more than he had ever received before. The pretence that it is based on resistance to any attempt to reduce wages is entirely groundless; and many hundreds of men have been deluded by a bare-faced swindle into a conspiracy against their employers and the public, and into abandoning a field of labor for which it will be difficult to find remunerative substitutes. Probably when the slow-footed truth becomes clear to the strikers, and they know (as they will) that no attempt at reducing salaries has been made, they will desire to return to work. But their leaders, anticipating this, have committed the rank and file to a demand for reinstatement in the positions which they held before. To concede this would be to displace the loyal men who have been promoted to vacancies voluntarily made by the strikers themselves. It is difficult to see how that can be conceded by the company, for it would be punishing the faithful for the benefit of those whose judgment, to say the least, were at fault.

J. W. SIMONTON.

Meanwhile new operators were presenting themselves for employment at all points. By January 7th the New York office was well manned. The Central Division from Buffalo to San Francisco was reported intact. The railroad companies everywhere offered their men to fill vacancies. The Montreal Telegraph Company pledged the resources of that line to enable the Company to maintain their ground.

We append some of the dispatches to record the animus of the movement, as better describing the feeling prevalent along the various lines.

LYNCHBURG, Va., Jan. 4.

I have just returned, after an absence of one week in Tennessee, and now realize the extent of the treacherous and disgraceful movement against the company, and am deeply humiliated to learn that some of the Southern operators have proved faithless, but am proud to say that none of the operators of this district have deserted their posts. I am arranging to send a few operators to other districts. The success of this movement would be a lasting reproach to the profession. I hope the company will not yield.

J. W. KATES, Superintendent.

PHILADELPHIA, Jan. 5.

The managers of the W. Union Telegraph Company have a sufficient force of operators in Philadelphia, Baltimore, and Washington, for the transaction of all business offering.

We find the dispatches too numerous to insert.

During the 6th, numerous letters from large holders of Western Union Stock, and public men interested in the movement, counselling a steady determined resistance of the strike, were received. Capable men also began presenting themselves for employment, and the company announced

OPERATORS AT WORK.

There are now on duty at the main offices Western Union Telegraph Company in New York, 27 operators; Boston, 16; Philadelphia, 15; Baltimore, 5; Washington, 10; Albany, 6; Troy, 4.

Dispatches from New Orleans were received as usual last night, and also from Europe.

The manager of the Western Union Telegraph office in Washington says he is able to keep up with the commercial and press business.

The company issued the following additional note :

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 BROADWAY, NEW YORK.

TO THE PUBLIC:—

Since the publication this morning of the card signed by the officers of this company, explaining the circumstances out of which the strike of the operators arose, a full and detailed statement of what occurred in California has been received from the company's agent, Mr. Mumford. They are as follows :—

About the middle of December, Superintendent Gamble, desiring to readjust the compensation of the employes at San Francisco according to the value of their services, gave notice to two operators that after January 1 their salaries would be reduced from $120 to $115 a month, and to a third that his salary would be increased from $100 to £120 a month, making an increase in the aggregate compensation of the three of ten dollars a month. Acting on these notices, as is supposed, the operators at San Francisco united in presenting a schedule of salaries which they asked to have adopted. In this schedule the two salaries which Mr. Gamble had proposed to reduce remained as before, and an increase of four others was asked for.

Mr. Mumford so far assented to the schedule as to make no reduction of salaries, and allowed a portion of the proposed increase. He at the same time informed the operators that the force in the office was larger than was justified by the diminished business, the number of messages being less than usual and the receipts lighter. The operators themselves admitted that more men were employed than was strictly necessary. To bring the force thus into harmony with the wants of the business two men were dismissed, but they were not the men whose salaries Mr. Gamble had in the first instance proposed to reduce. The salaries of those men remained unchanged, although one of these was dismissed after the reduction of the force above mentioned. A fourth man refused to work at the schedule price, although it was ten dollars a month higher than he had ever before received. Out of this state of things the strike arose.

The facts thus explained fully support Mr. Mumford's original statement, that he had reduced no salaries, and had no intention of doing so. He had, in fact, increased them upon the petition of the operators themselves, and the only man who appears to have left because he was dissatisfied with his compensation refused to work at an advance in his salary of ten dollars a month. The strike, then, is not, as the operators here have alleged and supposed, a strike in resistance of a reduction of wages—general or special—but in support of the claim of an individual whose salary has been raised, but not to so high a figure as he desired. It cannot be denied, in view of all the circumstances, that the whole body of strikers throughout the Union have left their work with a view and purpose of subjecting the business of the entire country to delay and derangement, because some John Smith, in California, demanding an increase of twenty dollars in his salary can get only ten dollars. This is the real issue, unless it is further claimed that this company shall not be permitted to determine how large a force is necessary to do its business, and to increase or diminish it from time to time accordingly.

O. H. Palmer, Treasurer.

JANUARY 7TH.

The following dispatches from different points South and West show the condition of the telegraph offices to-day:

Washington, Jan. 7th.

There is no necessity of duplicate news to the Senate by mail. Our reports reach nearly all points in that direction.

M. W. Barr,
Southern Agent of Associated Press.

Philadelphia, Jan. 7.

Two Philadelphia strikers have returned to duty, believing Judge Palmer's statement that no reduction of salary was made at San Francisco to be true. They think, therefore, that they are fully justified in withdrawing from the league.

D. H. Bates, Superintendent.

Richmond, Va., Jan. 7.

All the men in Dowell's Division, including the entire State of Virginia, have resumed work.

Augusta, Ga., Jan. 7, noon.

Our connections are intact throughout the States of Georgia, South Carolina, and Florida, and with a single exception of a portion of the Atlanta office, every man has remained faithfully at his post, and to his duty and honor, preferring first to learn the truth and decide for himself as to the merits or demerits of this movement, the statement of the New Orleans reporter to the contrary (that all offices had ceased doing business) notwithstanding. The latter has been badly mislead.

J. A. Brenner, Superintendent.

Louisville, Ky., Jan. 7.

Seven of my districts are intact (there are eleven in all, excluding Arkansas and Northeastern Texas). Not a single man in them has joined the strikers. The chief trouble is in Dowell's and Trabue's districts, and at New Orleans. Dowell's men have since returned to duty, as per Richmond dispatch above.

We are sending spare operators from other districts, and rapidly reinforcing deserted points. Have gained ground rapidly.

John Van Horne,
General Superintendent of Southern Grand Division.

Louisville, Ky., Jan. 7, noon,

The prospect is brightening every hour in this section.

Boston, Jan. 7.

I have visited the main way offices in my district, and they are sound to a man. The railroad offices are with us. In an interview I had with ——, of the —— railroad, he said he was the owner of several hundred shares of Western Union stock, and he wanted the directors to expend every dollar of it if necessary, but never to yield.

We are filling up in good shape. The hotel offices here will be reopened to-day, and applications are coming in rapidly for situations.

To those who have stood to their posts all credit is due for withstanding the efforts which have been made to induce them to join the deluded victims of the strike.

C. F. Wood, Superintendent.

Philadelphia, January 7.

Two of the Philadelphia strikers have resumed work in the Western Union office.

Boston, January 7.

To General Eckert, General Superintendent.

I am having applications from competent men. Am I authorized to offer them permanent situations at what I consider fair salaries?

C. F. Milliken, Manager.

Rutland, Vt., January 7.

Six of the Vermont brigade started for —— yesterday and last night. Use them as long as needed. This office is supplied with new men, and all is working freely. ——, who is at ——, is also at your service.

G. W. Gates.

Richmond, January 7.

To O. H. Palmer, Secretary and Treasurer, W. U. Tel. Co.

I am pleased to say that the strikers here have surrendered unconditionally, and my district is again fully organized.

J. R. Dowell, Superintendent.

Washington, January 7.

To the Associated Press.

Contrary to the published statements of the Washington Telegraph League, no report whatever regarding the strike was sent hence last night by the Associated Press. On inquiry at the Western Union Telegraph office this morning it is ascertained that the office is prepared to receive and transmit all business offered. The force now on duty consists of thirteen operators, besides the manager, and an additional number are now on their way hither. Two of the branch offices in Washington have been reopened, and the same is expected of all the others in the course of several days.

A statement has been prepared by Mr. Tinker, the manager, and Mr. Whitney, the cashier, in reply to that of the Washington Telegraphic League, in which it is said, among other things, that all the old force are now on duty in the Richmond office; and they, last evening, sent an appeal to the strikers here to follow their example; and advices were received to-day that all the men in that district (comprising the lines from Richmond south to Augusta, via Wilmington, and to Charleston, via. Greensboro, and west to Lynchburg and Gordonsville) have returned to their work.

The statement of Messrs. Tinker and Whitney concludes as follows:

"Our facilities are hourly increasing here and elsewhere, and the company is confident of its ability to do all business offered."

FROM THE PACIFIC COAST.

THE TELEGRAPH STRIKE IN SAN FRANCISCO.

San Francisco, Jan. 7.

The telegraphers' strike continues without retarding the business of the company. The *Alta California* approves the position of the management on this coast. The *Bulletin*, after publishing the statement of both sides, closes a long editorial as follows:

"We cannot believe that the eastern operators were correctly informed of the slight cause for the strike in San Francisco before taking a step which forces the necessity upon the company of maintaining its position at all hazards."

JANUARY 8.

(From the New York Times.)

THE END.

The strike of the telegraph operators still continues. The men in New York were greatly encouraged yesterday by the receipt of cheering dispatches from their brothers in several cities, announcing their fixed resolution of holding out and accepting no compromise. In the course of the evening, however, a report was circulated that the men had resumed work at Richmond, Portland and other places. This, though not entirely credited by the members of the League here, had the effect of somewhat damping the enthusiasm of the men and shaking their determination. Two meetings were held yesterday at No. 270 Grand street, when private business of the League was transacted.

It having become evident that the strike had been thoroughly subdued, and to prove to the men who had left its service that no revengeful course was designed, the Executive Committee issued the following:

CARD FROM THE COMPANY.

The Western Union Telegraph Company have issued the following:

Executive Office,
Western Union Telegraph Company,
No. 145 Broadway, New York,
January 7, 1870.

To all Officers and Operators of the Western Union Telegraph Company:

We are happy to announce that the most inexcusable and unjustifiable conspiracy ever attempted upon an extensive public business has failed of its nefarious purpose, that the crisis has passed, and our business is rapidly resuming its accustomed course. We sincerely regret to learn that some of our trusted employes have assumed secret obligations, under which they have considered themselves bound to violate their open business obligations with us, and to aid in the prosecution of measures aimed at the welfare and prosperity of this company, with whom they have so long maintained relations of mutual respect, good will and confidence. That such men should have taken upon themselves obligations of such immorality and bad faith is only to be explained by the supposition, which we are glad in charity to admit, that their full effect and purpose were not appreciated. The performance of these obligations being entirely at war with the due regulation and control which the company should have over its employes, would render the carrying on of telegraph business impossible.

It is now well known that the alleged pretence of a contemplated reduction of wages was entirely unfounded, and that but one man has left the employment of the company upon a question of compensation, and this person was not dismissed, but refused to work because his salary was increased only $10 a month when he demanded $20; that the other salaries in the San Francisco office were adjusted upon a new scale, in part suggested by the operators, by which some were increased, but none reduced; that the force in the San Francisco office being too large for the requirements of the business, two men were relieved, and among them one Jacobs, whose misrepresentations appear to have furnished the occasion for the hasty, inconsiderate and unjustifiable action of so large a body of men. It appears this Jacobs was a prominent officer in what is called the Telegraphers' League, a society the existence of which was not known to the company, or to Mr. Mumford, our agent on the Pacific coast.

The officers of the company desire to express their hearty gratitude to those of our employes who have remained loyal to duty, and to assure them that the Western Union Telegraph Company will not forget their manly and honorable conduct. As to those who have been misled, we desire to submit the question, whether they regard themselves as irrevocably bound and enslaved by their secret oaths and obligations. It seems to be impossible, if they will pause and reflect, that they will thus voluntarily abandon their personal independence and individual manhood. Among other obligations irreconcilable with good faith and self respect, it is provided by the constitution of the "League" that "the League expects every member to perform his whole duty towards his employers in accordance with the terms under which he was engaged, *provided he does not thereby conflict with a duly authorized order from the chief* (League) *operator of the Circuit to which he belongs*," and further that "no member shall be at liberty to leave his regular duties to operate in any other town or city under orders from any telegraph company without having first received permission from the chief operator" of such League. It is also further provided by the initiatory oath that the member "will make common cause with the members of this League, that forsaking your allegiance to corporations or individuals, you will, if necessity requires it, place your time and services at the disposal of the officers of the Telegraphers' Protective League." Now have you considered that such an organization may be managed and through it you be controlled to serve an interest hostile to your employer and for the basest purposes, without benefit to yourself. Do you think any telegraph company could with safety submit its interests to the hands of men thus bound to act, subject to and at the bidding of a secret, irresponsible and perhaps hostile control. There are men of this class whose personal honor and integrity would be sufficient security for any undertaking; but if such men agree in advance to substitute for their own judgment and consciences the arbitrary commands of others, they lose that just claim to confidence to which their characters would otherwise entitle them. Do you consider yourself, I again ask, as having irrevocably bound yourselves to these unmanly and degrading obligations, which are by the common sense of mankind pronounced without any binding force in honor or conscience. They tend only to impair your usefulness to yourselves and to your employers, and ought to be promptly renounced.

Such of you as think rightly upon these questions and desire to return to the employment you have left, will be received with the same feeling which always hitherto has been entertained for you, and be protected in the quiet and peaceable performance of your duties.

O. H. Palmer, Treasurer.

THE WESTERN UNION COMPANY AND THE STRIKERS.

Office Western Union Telegraph Co.,
Washington, D. C., Jan. 7, 1870.

Editor Star: In view of the statements which have been made public relative to the facilities of this company for doing business, it seems necessary that the real condition of affairs, so far as this office is concerned, should be made known. It is not proposed to discuss the merits of the question at issue between the company and its late employes, but certainly the attempt to mislead the public as to the ability of the company to do their business is neither fair to the company nor their customers, and will hardly be considered a legitimate method of carrying on the contest.

This office is prepared to receive and transmit all business offered. All business has been promptly and regularly forwarded thus far. The force now on duty consists of thirteen operators, (instead of four as reported), besides the manager, and more are on their way here. As to the character of these operators, the names which those who differ with them may choose to apply is a matter of taste, but the real truth is they comprise as good men and as good operators as ever were in this or any office. Were the contrary true they could not have performed the work as it has been performed.

The branch offices at No. 432 Pennsylvania avenue and in the Post Office Department have been reopened, and it is expected that all the others will be soon.

With regard to other offices, we are working regularly with every one of the offices mentioned as closed in the circular issued last evening by the "Telegraphers' League." In regard to the Richmond office especially, the last man of which was reported to have left, the truth is that "the last man," and all the other men of the old force, are now on duty, and sent last evening an appeal to the strikers here to follow their example. And we have advice this moment that all the men in that district, comprising the lines from Richmond South to Augusta, via Wilmington, and to Charleston via Greensboro, and West to Lynchburg and Gordonsville, have returned to their work.

Of course the company has had to strain every nerve to meet the demands of the public in this emergency, which, so far as this office is concerned, was precipitated upon them at fifteen minutes' notice, and there has been literally no time for anything but incessant work; but the work has been done, is being done, and will continue to be done as it always has been. Our facilities are hourly increasing here and elsewhere, and the company is confident of ability to do all business offered.

This statement is considered due alike to the company and the public.

Leonard Whitney, Cashier.
Chas. A. Tinker, Manager.

We are informed that on the day on which the foregoing was issued, a gentleman entered the office of the Franklin Telegraph Company, New York, who was informed that not an operator remained on duty at the Western Union Washington office, and that the manager, Mr. Tinker, was ill in bed!

THE DEATH.

The operators are all at work east and north of Boston. There is no strike in that section. There are twenty men at work in Boston, nine in Albany, five in Troy, thirty-nine in New York, which is the full complement of day operators, and thirty night men. There are twenty-six at work in Philadelphia, ten in Baltimore, and fourteen in Washington—the full force. Operators are being sent from Philadelphia to supply Camden, Chester, and Lancaster. All the other offices have been supplied.

THE END OF THE STRIKE IN PHILADELPHIA—ACTION OF THE OPERATORS—A CARD TO THE PUBLIC.

Philadelphia, Jan. 8.

The telegraphic strike in this city is at an end. Fifteen of the strikers that left the Philadelphia office of the Western Union Company have returned to their duty. They have signed the following paper disavowing their connection with the League:

Having been fully convinced in our minds that we have been grossly deceived by our officers at New York, and that the present strife between the Western Union Company and its late employes is entirely unjustified on the part of the strikers, I hereby renounce all connection with the Telegraphic Protective League. I feel we are doing it as an act of justice to the company and to our families.

Only seven of the original strikers now remain on the strike. The operators who have been placed on duty in the Philadelphia office have also signed the following card, contradicting the damaging reports as to the management of the offices at Philadelphia, Baltimore, and Washington during the strike.

Philadelphia, Jan 8.

Having withdrawn from the Telegraphic Protective League, and returned to duty with the Company, and having made personal inquiry and investigation in regard to the manner in which the business has been done since the strike, we are satisfied that the statements issued from time to time to the effect that the offices at Philadelphia, Baltimore, and Washington have been manned with boys and incompetent operators, and that in consequence the regular business has been seriously delayed, are wholly incorrect. On the contrary, we believe the business to have been done without material delay, and that the force on duty at the points named, as well as at other points and offices, has been composed of men of first-rate ability.

Augusta, Ga., Jan. 7, 1870.

O. H. Palmer, Esq., Treasurer.

I am proud to say that during the struggle or movement erroneously made against the company, not a single employe of this, the Third District, raised his hand in opposition to the company's authority, or left his post.

Yours respectfully,
J. A. Brenner, Superintendent.

At the close of the week the business throughout the Union had resumed its usual course, here and there only existing a pressure from diminished force, and the office at New Orleans practically closed, but with a full force on its way thither to man it.

JANUARY 9.

On Sunday, the men who had heroically toiled day and night to keep up the company's business, took a much needed rest. General Eckert took his first square sleep, having been at his post almost without an interval of rest or sleep during the four previous days.

MONDAY, JAN. 10.

All the offices opened with a force sufficient to do all business offered, and with lines working direct to New Orleans, and other points.

Numerous confessions of sin were received during the day, and some of the wiser men thought the show was over, and they had had all the fun they wanted. They wisely thought that their families had the first claim on their attention, and that "Jacobs" had had already too much of their time. As a Californian remarked to us, "If these strikers could only see the 'original Jacobs' they would be ashamed to have been influenced by him." Jacobs may be an angel, but he is represented by those who have seen him as small and quarrelsome, one of the fidgetty, restless, creatures who are never happy but in "kicking up a muss."

THE STRIKERS IN COUNCIL.

At a meeting of the strikers, held yesterday at No. 270 Grand street, encouraging dispatches were received from all points. The chairman read the following from Nashville, dated January 9:

R. W. Pope and All:

We had a meeting with the Typographical Union, and they are with us soul and body. Resolutions were passed calling on the President of the International Typographical Union to call on all subordinate organizations of that Union to take action as to refusing Western Union reports until our demands are complied with.

Nashville Circuit.

TO THE LAST DITCH.

Mr. Ashley, Editor of the *Telegrapher*, addressed the meeting for a few moments. He said the *Telegrapher* would stand by them to the end. The Western Union Company are bound to make a big fight of it. They claim to have men enough to do their business, but this could not be so. He was sorry to see that some of the operators in Philadelphia had gone back on them, also one man in this city.

Mr. Ashley's interests are identified with the success of strikes, his paper being the organ of the dissatisfied everywhere. The strike is largely the result of his influence and advice.

A resolution was also passed instructing the Committee on Publication to have printed and distributed 5,000 circulars refuting statements made in a circular distributed by the Western Union Telegraph Company.

A committee was appointed to investigate the truth of a statement made by a striker to the effect that the Western Union Telegraph Company are sending dispatches over the lines of the Bankers and Brokers' Company.

CHANGE OF BASE.

On Tuesday morning the papers published the following extraordinary card. It is remarkable chiefly for its assumption of the duty of protecting the virtue of the Telegraph Company, and the interests of opposing lines. It sounds like a *Herald* editorial. The Junta had accused the Telegraph Company of endeavoring to make up their losses by reduced rates out of reduction of salaries. Now, they claim that no reduction has been made except to places where there is no competition! The grievance now is that the Western Union Company does not encourage opposing lines! What on earth Messrs. Burhaus & Co. have to do with the tariffs, it is hard to guess. The card is nothing less than a circular in behalf of opposition lines and reveals from what source the animus of the movement has come. Head-centre Pope stands back of this committee of deluded men, representing interests which tend more than all else to cheapen labor, and which will appear in due time as unnecessary. There is something sadly amusing in the opening strain of the following very remarkable card:

CARD OF THE STRIKERS.

The following card was issued by the telegraphers on strike in this city yesterday:

New York, Jan. 10, 1870.

To the Public:

We announce with pleasure that the most inexcusable and unjustifiable conspiracy ever attempted upon an extensive public business is about to fail in its nefarious purposes. We allude to the action of the Western Union Telegraph Company, in reducing the wages of their employes for the sole purpose of competing with and monopolizing the business of other companies.

Although it is generally known that the telegraphers in the employ of the Western Union Telegraph Company are on a strike, the results which will naturally follow if the company succeeded are not properly appreciated by the business community. This company have reduced the tolls to certain points we admit, but these reductions are only made to places where there is competition; and, instead of reducing the fat dividends to accomplish their purpose, the scant pittance paid to their overworked operators is taxed to make up all deficiencies caused by this unjust, uncalled for and dishonorable warfare upon the public and opposition lines. That the event of the success of the Western Union in destroying all opposition would result in placing the public in the power of this monopoly, to dictate whatever rates they might demand, no one will ever question, and if we may judge from the past the new rates would doubtless prove a source of congratulation to the directors upon the increased dividend upon their watered stock.

The issue involved between the officers of the company and the League for the first forty-eight hours of the strike was one of veracity between the agent of the company at San Francisco and the chief operator of that circuit. The League based its action upon information received from Mr. Jacobs, who assured them that reductions had been made, and had been going on some time before; and the officers, on the other hand, relied upon statements forwarded by Mr. Mumford, their agent. Since then mail advices from Mr. Jacobs have been received, which leave no doubt of the reductions in San Francisco, and that for some time reductions have been going on along the Pacific slope, and the League is now in a position to prove to the public that the statements of Mr. Jacobs by telegraph were correct.

The question has been asked, "Who is Mr. Jacobs?" and it has been claimed that he is an "unknown and irresponsible correspondent." In contradicting this we wish to state that Mr. Jacobs is personally known to many of the telegraph fraternity, not only in this city, but in this country, and he is in every way responsible for the statements he makes. Among the craft he has a high reputation for honor and integrity, and his personal character will compare favorably with any of the officers or directors of the Western Union monopoly. We have thus briefly stated the case to the public, which we felt called upon to do in answer to the circular issued by the Executive Committee of the Western Union Telegraph Company, bearing date January 7, 1870, which from beginning to end is a misstatement of the true facts, and an appeal to their late operators to help them out of their present dilemma. As considerable stress is put upon the obligation assumed by members of the League, we desire to say that similar and more binding obligations exist between the officers, members, and superintendents.

We have pledged to each other our honor, which we are disposed to respect, not for the forcing of unjust and arbitrary measures against the company, but for the mutual aid, benefit, and protection of ourselves and our families, and to resist the encroachments constantly being made upon us, and we ask the sympathy and support of a generous public to aid us in the stand we have taken, feeling assured that the interests of the public demand that this monopoly shall not be permitted to control the entire telegraphic interests of this country.

W. W. Burhans, Chairman, }
C. J. Ryan, } Committee.
J. M. Peters, }

This card, so utterly irrelevant to the supposed issue between the parties, so revelatory of an influence and support purely foreign and hostile, cannot avoid changing the whole status of the contest, and compelling the company to regard the strikers, or rather those who lead them, as paid assassins of its interests and business.

The Western Union Telegraph officers make the following statement of the condition of their wires to-night for the information of the public:

All commercial business and press matter has been promptly transmitted to all points, except for a few offices south of Richmond, which will be reopened in the morning. Augusta and the Cuba cable circuit are working direct; New Orleans direct also. The Western and Eastern offices are reported fully manned, and business moving briskly. The Congressional press matter went through in fine shape, and both printing circuits open to Washington until 1 o'clock A.M., when the files were clear. Long reports for the press have been forwarded over the wires from Washington to-night, and have been received with usual promptness and dispatch.

JANUARY 11.

The men on strike in Albany, and other cities have returned to work, having previously abjured their connection with the League. The leaders of the movement are making desperate efforts to obtain the sinews of war, and last evening delegations from their number waited on various labor organizations and demanded pecuniary aid. In most instances their applications were unsuccessful.

The strikers still continue to hold meetings twice a day at No. 270 Grand street. Mr. Conolly, a delegate to this country from the English trade unions, was present by invitation, and addressed the meeting at considerable length. Messrs. Jones, Fox and Peters also addressed the meeting. Mr. Pope, who has just returned from Philadelphia, where he had been to address a meeting of the disaffected, made a few remarks, in the course of which he alluded to the fact that the Western Union Company are putting forth strenuous efforts to keep a sufficient number of operators in Washington to get the Associated Press dispatches through all right, so as to enable them to make a good show before the public.

Mr. Bellows offered a resolution, which was adopted, providing for the appointment of three committees to attend meetings of the Plasterers' Union, the Typographical Union and the Laborers' Union.

This Mr. Bellows was formerly an operator of the Western Union Company, and has not lately been in their employ. He is a volunteer, and assumes to be a stockholder and the special friend of General Eckert, the General Superintendent. He is not known as a stockholder on the company's books, but pursues the vocation which his name indicates as an agreeable pastime.

On January 10th, at noon, two Southern Districts, under Superintendents Brenner and Dowell, under the stimulus of the National Labor League and agents sent South for that purpose, struck, but on the following day resumed operations.

January 12, noon. We close this lengthy record at this date, feeling that throughout the Union business has resumed its normal condition. Throughout these eight days of intense earnestness to save harm to the public, and maintain the appropriate vigor, we have not been able to detect the least bitterness towards the men who have left the company's employ. Nearly all have been regarded as the victims of a concealed enemy, whose purposes this strike has been used to advance. We are sorry to find so many old friends among the departed. We hope they will in due time return, able to accept a true service, restricted by no private oath. The latch string is on the outside. We close with a sensible article from the New York *Times*, published to-day.

THE TELEGRAPH TROUBLES.

There is now a good prospect that the telegraph difficulties will pass off without any serious disturbance of the public business or convenience. The Western Union Company has shown itself master of the situation. The company has wisely avoided acrimony, and has taken matters very coolly and in good temper, so that it is able to meet those who return in a friendly spirit, without restraint on either side. The operating force between New York and Washington was probably never better than now. The fullness of the Washington dispatches yesterday and to-day, and on the reassembling of Congress, has been quite noticeable. Had there been weakness anywhere, it would have shown itself most noticeably there; and the conclusion we arrive at is that the Western Union Company is in full control of its own business.

This, of course, is just what the leading spirits among the strikers do not like. For, extraordinary as it may appear, the strikers accept the issue, whether the company, which has a large amount of capital involved, and which has organized its business thoroughly, shall now manage the business for itself or let others manage for it. This is certainly all the card from the operators, which we published yesterday, can mean. It complains of the reduction of tolls—a measure demanded again and again by the people, and urged upon the company—on the ground that this low tariff will "destroy all opposition." And it is on this ground that the operators hope for public sympathy. If reducing the tariff of charges be, as the operators declare, "a dishonorable warfare upon the public and upon opposition lines," all we can say is that, as a part of the public, we wish the same "dishonorable warfare" might be practiced by a good many other public companies, such as railroads, steamers and express lines. They could take with advantage a leaf out of this chapter of "warfare against competition."

Meanwhile, however, the question reverts, how the dissatisfied operators have come to be the guardians of the public interests, in the way of preserving high tolls. The answer is that they think a reduction of tolls will be followed by a reduction of salaries. In other words, they, operators and employes scattered through the country over thousands of miles, propose that they shall first be consulted before the company makes any change in its business policy. The proposition they make is substantially that the company shall no longer retain the management and control of its own property, but shall surrender it unconditionally to the caprice of an outside organization. We hardly think the business men of the community, or any people who know the labor involved in laying and establishing a complete system of telegraphy across a continent, will sympathize with this modest request.

It was this outside organization, called the "League," which persistently declared that a movement for the reductions of salaries had been "going on for some time" on the Pacific coast, and that these reductions were to be continued all over the country. The company has denied that these were the facts, or that this was its intention; and certainly the company ought to know what it has done and intends to do. It seem to us that the outside organization arrogates to itself a power of decision in the premises, which is not based on any substantial authority.

PRESS CONGRATULATION.

So far as the heaviest customers of the Western Union Telegraphic Company, the newspapers of the country, are concerned, there has been very little reason as yet to know that a strike is in progress along its lines. Believing the strike to have been without sufficient cause, we are heartily glad to perceive that the company is likely to suffer so little embarrassment from it, and to note the indications that the worst of the trouble is already over. The strike was so timed as to leave the company without the aid of its very efficient president, Mr. Orton, who is now absent in Europe; but the other officers have acted with tact and discretion in the embarrassing circumstances in which they were suddenly placed, and to their wisdom is largely due the present encouraging state of affairs.—*N. Y. Tribune, Jan.* 8.

We are compelled to omit a large mass of editorial comments from the New York journals, but which will appear in our next issue.

Self-Closing Keys.

To save a great deal of useless correspondence and invention, we have to say that Mr. Jos. J. B. Frey has long since patented the system of transmission by Morse or other characters on an open circuit dispensing with all parts designed for closing; also the altering of the present style of keys to accomplish the same purpose by means of an anvil beneath the back adjusting screw of the key arm; also by means of an arm extended over the lever, with contacts above the lever. The patent covers all modes of effecting this purpose, as was published eighteen months ago. The cuts exhibited in the issue of December 1, are but two designs out of many to accomplish the like purpose.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 6,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

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Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, JANUARY 15, 1870.

The Strike.

It has been apparent to a few who have been intimate with the inside movements of telegraph offices during the past few months, especially in the City of New York, that under some pretext, or under none, an emeute was designed and certain. Of this we had the evidence, partly by that muttering intimation of insubordination which one feels rather than hears, and partly by documents written under a like apprehension, and upon indications of a more demonstrative character. Yet the operations of the now revealed League were so quietly arranged, that the impression deepened in our mind that upon no false or unreasonable basis, could any large portion of so intelligent a body of men as composed the operating force of the Western Union Telegraph Company be induced to take a part in any revolutionary movement which a restless and ambitious element among them might inaugurate. In this we were mistaken. A wide spread secret organization had been formed, designed to act as a unit, and bound together to accomplish any design by a united blow, and by concerted signals. Events have proven how much labor must have been bestowed in furtherance of this design, and how well it was accomplished.

Carefully and energetically, however, as the bonds of membership had been drawn in order to insure united action, every man having been placed face to face with an oath from which, once taken, the conscience and sense of honor instinctively refused to flinch, the League was essentially weak, and its protracted existence impossible.

Its chief element of weakness, although the apparent source of its power, was the very oath upon which membership was based. Thus solemnly pledged, no Christian man, no man claiming honor, could, with a clear eye and an uplifted head, engage himself to any company without their knowledge of its nature and scope. Equally true is it that an upright man, in the service, could not assume obligations to an outside power by which his service was thus limited, without a frank avowal of them to the party to whom he had pledged himself. A false contract is essentially cowardly and criminal. It will be said, of course, that such an avowal would have made an engagement impossible. True, and the admission reveals the injustice of the concealment. The employer has, certainly, rights equally with the employed, and in a business where its value and security depends so much upon continued personal service, the bonds, mutually existing, must be based on mutual honor, and the engagement to the one be as complete as to the other. So an honorable and simple minded man would judge. This League, therefore, founded on a secret oath, which, alike in its terms, its scope and its design, we contend to be utterly abhorrent to Christian conscience and essentially dishonorable, thereby sealed its intrinsic weakness although it insured its power for mischief. With such a volcano beneath the telegraphic service of the country, the public had no security, the company no cohesion, and telegraphic property no value. And yet this secret organization by reason of its unrighteousness, had in it the elements of its own destruction.

Not only was the League weak by the absolute surrender of individual judgment to an extent utterly incredible, but in the depositary of its power. Had the organization been in the hands of men of cool judgment and caution, and of that slow snake-like precision and care which never strikes until every avenue of failure has been guarded, the result might have been disastrous although longer delayed. An issue would have been carefully planned to secure public sympathy. The company might have been trapped into some act by opportunities designedly afforded, which would have stopped all executive explanation. Wise, true men, would have made the strike, on the pretence out of which this has grown, impossible. As it is, the whole issue has been natural and legitimate. Three young men, resident in New York, not one of whom was known to possess any qualities of unusual discretion, had become entrusted with the absolute right to dictate the movements of nearly two thousand persons scattered over the nation who were performing a class of labor indispensable to society. All freedom of judgment had been surrendered to this metropolitan trinity. They could stop by a word, apparently, the communications of a continent. They could arrest the chief arm of commerce by a breath. They could bring the executive of the company they served to their feet. The power was great and full of thrilling temptation. It was too great, too glittering, too hot with possibility, to hold calmly. To bend to the discipline of an office, and be compelled to perform the allotted hours of service with such a power big within them, was too much for the brains who bore it.

Unfortunately, also, the chief of this trinity by which the League was governed, was a man in the employ of parties hostile to the company upon whom the experiment of mutiny was to be tried. He had nothing to lose but everything to gain. He was backed by interests which rejoiced at the prospect of injury which the strike held over the "gigantic monopoly." As an individual he had no status of character or mental ability to warrant the enormous trust confided in him. Here, therefore, were two thousand men widely scattered throughout the country, bound to the dictum of three men, unused to power and nervously anxious for its display. It is not too much to say that the opportunity was desired long before the occasion of the recent strike presented itself. It was designed, we learn, to occur during December. It was sure to come. Its coming, alike in its inception and in all its course has revealed its danger, its injustice and its dishonor.

The facts out of which the great telegraphic strike originated which has so agitated society during the past fortnight, are correctly although not fully stated by one of the strikers, and to which we call attention. We are glad to get it from such a source.

Stephen D. Field, a San Francisco striker, writes to Pope, the head of the Telegraphers' League, on the 2d of January, as follows:

> "A slight reduction made in the salaries of two of the members of Circuit No. 32 was met by a petition from all the operators in San Francisco. Mumford, the managing agent, called the two first men whose names were on the petition into his office, and informed them indirectly that he was going to make this a test case. They were dismissed and their salaries taken to increase all of the other salaries up to $120 per month, an increase in some cases of $15."

Had Mr. Field added that this "slight reduction" of $5 each per month from two men whose services were utterly unnecessary, was accompanied by an addition to that of others by which the aggregate was increased, the whole truth would be stated. It shows, however, if it shows anything, a reluctance to dismiss a superabundant force, which was only ordered when the indications of defiance became manifest, not for purposes of economy, but as a test of authority. The petition seems to have been regarded by Mr. Mumford as a threat.

Let us see its agent. Correspondence published in the New York papers reveals that Louis N. Jacobs was selected to be the agent of the League at San Francisco, evidently at his own suggestion. He was unknown in the East except by this correspondence. We know him. He was in the employ of the California State Telegraph Company two years ago, and had to leave the company's service because of a night brawl with a fellow operator in the office of the company. He then entered the service of the opposition line, during which he had a fresh quarrel with another member of the craft. In the union of lines which occurred some time ago this pugilistic Jacobs was again within "Union" lines. Of course it was unpleasant to him. By his own confession, and we think with great truth, it was unpleasant to his employers. He did not like to be under authority and growled daily. This is seen in his message, the termination of which reveals the man and his disease:

> "We do not intend submitting to the whims of an overbearing agent, who, on his last visit East, had his salary raised from $5,000 to $6,000 per year, and no doubt intends it should come from the operators. (Signed,) L. N. Jacobs, Sec. T. P. L."

This overbearing agent is a just, generous, considerate gentleman. There is not an office in the whole world made so attractive to operators. Its ante rooms, reading room, and all the interior arrangements indicate a man kind and considerate to those under him But Mr. Jacobs cared for none of these things. He wanted more pay and plenty of it, and because of an attempt to discriminate in the value of service by which the average of compensation was practically increased as may be found elsewhere, he telegraphed East "The work of general reduction of salaries has commenced. We resist. Stand by us." Jacobs thus lighted the fire by which he has made his name historic. As a gentleman who knows him well remarked to us, "Jacobs would kick up a muss in heaven." He is, however, by no means the author of "Jacob's Dream," nor has he, we fear, seen any "ladder" by which to reach so serene a region.

From such a source the strike began. In vain the Executive of the company in New York assured the Burbans committee, who charged this attempted reduction of salaries upon the company, that there was no such design as that imputed to them. These assurances were rejected.

Acting on the indefinite information of distant parties, and on statements which they were assured were false, hundreds of men held by their oath to do as ordered, left their posts, many of them without an hour's notice. Public business has been periled, commerce deranged, and hundreds of families, for a time at least, injured and impoverished. Having taken from men of character the right of judgment, the League has left them in the cold. It has held the officers of the company as liars. It could claim no grievances save the discipline of rigid, yet considerate and just authority. Salaries were everywhere fair and the management almost universally kind and sympathetic. But the blood was up, and a trial of strength was determined. This was the real animus of the strike. The discharge of two unneeded men at San Francisco, and a false statement that salaries had been reduced, was Morgan enough to answer the purpose, and, supported by outside interests, Mr. Head Centre Ralph W. Pope issued his bull and made the issue.

And what an issue! It has practically broken the entire League, and coffined it in utter death and ignominy. It has caused hundreds of men and not a few deluded women to be permanently dismissed. As we write we see young men pass our window voluntarily beggared in a city where every tenth man is idle. Some of these we helped to educate and encouraged to rise. We look at them in sorrow. They are our brothers. But they have placed themselves in the keeping of bad men. And now, having made their own bed, we must be content, as best we may, to allow them to lie there, unless they accept the hand which has been, with much wisdom and generosity held out to them to return.

What has it done to the company this movement sought to rule? It has enabled it to remove from its internal operations a gigantic evil. It has cast out a source of demoralization which imperilled administration and threatened the value of property. It has brought to light the men who kept labor in ferment, and who now have the largest liberty. It has strengthened the company and exhibited the equity and firmness of its administration before the entire nation. True men have been proved and honored. It has cleared the air, cheered faithful men, and put the company on a stronger basis of labor and administration then ever. It has released it from considerations of delicacy which induced it to retain men in its employ because of long service, but who were unneeded. Nothing, even at the cost it has involved, could have better or more widely served the company's genuine interests and progress. In all respects it must result in the utter defeat of an organization big with opportunity for usefulness and brotherhood, but which has been used by designing men for purposes of ruin, was planted on a dishonorable vow, and which the majority of its members to-day bitterly acknowledge and regret.

We are not prepared to denounce measures for the protection of labor. We acknowledge its dignity and rights. The man is as good as the master in his sphere and labor. The operator is as much a man as the President. But the executive of companies are laborers also, and have rights and duties. The Western Union Company officials are falsely accused of courting and practising oppression. But the ease, comfort, success, vigor of administration, aside from all personal tendencies, lead otherwise. The officers of the Western Union Telegraph Co., by almost general admission, have allowed liberally for service, and it is for their interest that their policy be essentially kind and respectful to all subordinates. Compared with the exactions in other employments and their meagre incomes, the service is generous and paternal. In the management of 6,000 men, instances are easy to find of what, at a distance, bears the color of injustice. But no such stain rests on the general policy of the company. Even the strikers do not charge it. But the telegraph service demands a rigorous discipline to which its earlier administration was unused. The character of the business has wholly changed. It cannot now subserve public interests or its own healthful development without the precision and uniformity of mechanism. In the nature of its duties, its men must be as true and steady to every work assigned them as the bucket to the wheel. No considerations of kindness or personal popularity can be allowed to interfere with the exercise of an authority which, while it should be kind and just, must be absolute and rigorous. This strike, indeed, has been, in its true animus, a strike against this essential element of present telegraphic management. No company can act energetically under the shadow of a League for mischief thus brooding over it, and it is essential to its existence and mission to root it from the system utterly and forever. Even were there no such necessity for the mere purposes of administration, the national industries are so dependent upon the Telegraph that, to stop its operations, or permit any organization to endanger its daily public use, cannot fail to become regarded as a crime against society and the nation.

To the fidelity of all officers and managers of offices, during these trying days of anxiety and toil, the company is much indebted. We know of but a single exception to this universal fidelity, and it was harmless. Much heroic labor was performed by many operators, who stood by the company in their necessity, and who will receive, we trust, the proper recompense of their devotion. The general result to all concerned, except the misguided men and the worse than misguided women who have cast themselves from an honorable and generous service, cannot fail to be healthful and encouraging.

The Situation.

It is a matter of justifiable curiosity to know the changes which this strike has occasioned, and which we give as correctly as possible. We write this January 14th.

CITY OF NEW YORK.

In the ladies' department, under Miss Snow, seven operators and one clerk left. These ladies were in receipt of good salaries, and to those interested in female labor, their departure, under the circumstances, has caused much regret. They had taken the League oath. As they rose to leave, they were kindly urged to remain were warned that a number of applicants were ready to fill their places, and that, therefore, if they left, they could not be restored. On leaving their places were at once supplied.

In the general male operating room, 145 Broadway, where the usual force is 75, 64 persons left, leaving 11 on duty, on the afternoon of January 4th. By the close of the week 51 persons were on duty, and the hours of service so arranged that every wire was duly served. Fourteen of the 64 who left have returned, on condition of abandoning all obligations inconsistent with their service to the company. By the indomitable energy and fidelity of the few men left at the time of the strike, some of whom worked forty-eight hours almost without intermission, and by the aid of several efficient lady operators, who are also deserving of all praise, surprising as it may seem, the business was not only transmitted, but so promptly, as to give to very few persons evidence of the reduction of the effective force.

In Boston, 25 male and 5 female operators left January 5th. On the evening of January 6th, the force was full without any striker being restored, except one of the female operators who returned to her duty. The only offices not loyal in the Fifth District were Boston, Stamford and New Rochelle. The operators who refused to join in the strike performed the entire work with the most hearty earnestness until relieved, and of whom, as of all his operators throughout the District, Mr. Wood speaks as deserving of the highest praise.

In the Second, Seventh and Tenth Eastern Districts, no strike occurred.

Third Eastern District. "There was one sinner who repented."

Fourth Eastern District. Rutland and Burlington struck, and new men appointed.

Ninth Eastern District. Three men on Erie Railroad refused to take Western Union business, and were dismissed.

In Albany, thirteen men left, all but four of whom have returned to duty, and these four are unneeded.

In Troy, the manager and his whole force were among the strikers. The office, however, after the second day of the strike, has been well served. The strikers have signified their willingness to return.

ST. LOUIS, MO.

There was only one striker in my district, outside St. Louis. I have organized a permanent force, Our sixteen strikers look sick. I could have procured one hundred operators if they had been needed.

R. C. Clowry, Superintendent.

Buffalo, N. Y.

Jan 13. Out of sixteen operators, eleven strike, leaving three chiefs and five operators. Five new men hired. Ten strikers knocking at tha door. One has been taken back.

N. Hucker.

New Orleans.

Jan. 13. Fifteen operators on hand here, and are all right. All strikers dismissed.

J. Van Horne, General Superintendent.

We cannot help mentioning that our old friend, M. C. Bagley, formerly of the New York Office, but who struck at New Orleans, telegraphs the officers of the League: "Been out five days, don't know what to do. What are you about." It is well the winter is mild. Poor Bagley, he was always unhappy.

OMAHA.

"All struck except manager and chief operator. None re-employed. Have five new men and will have full force to-morrow."

CHICAGO.

Out of forty-one operators, only two chiefs and four operators remained of old force. Applications to return, twelve. Present force forty-five. General Superintendent Stager has not determined yet to accept the return of the striking applicants.

PITTSBURGH.

Twenty-two men struck. Four have renounced the League on the 13th, and desire to return. General Stager has not yet determined to accept any strikers. Present force fourteen men, but every wire well served. Strikers claim to have captured and sworn in thirty-three men, who were sent to our relief.

C. O. Rowe, Superintendent.

CINCINNATI, O.

Thirty-four men struck. All want to return. None yet accepted. Present force twenty-four, so arranged as to perform all duties necessary.

INDIANAPOLIS.

Eleven men struck. All out still. Office well manned.

WASHINGTON.

Thirty-one men struck. Thirteen of these have returned after abandoning the League and renouncing its oath. Present force, thirty-four.

BALTIMORE.

Fifteen men struck. None of these have been restored. A good working force of eight men on hand, and business promptly performed.

PHILADELPHIA.

Twenty-two men struck. Of these fifteen have returned to duty. Present force, twenty-four.

We are compelled to omit the balance of these reports, for want of space.

◆

In the manufacture of the Persian Gulf cable, gutta percha has been discarded, and Hooper's compound instituted. It is regarded as superior, but hitherto has been difficult of preparation. The cable will be laid by sailing vessels in tow of steamers.

Charming.

We cannot avoid clipping the following from the New York *Herald* of January 13th, and which is the close of its London correspondent's letter of December 30th, 1869:

President Orton, who is now here, is known to be a benevolent and devoutly inclined citizen, and when he sees the advantages and blessings the government telegraphic system secures to the people of a country, he will no doubt return to New York, call a meeting of his brother directors and, after prayers, will propose the handing over of the whole plant of the Western Union Telegraph Company to Secretary Fish, for the benefit of the citizens of the United States.

◆

We regret to have to chronicle the death, on Sabbath morning last, of scarlet fever, of the daughter of A. B. Chandler, Esq., Superintendent of the Sixth District. She was a very sweet child, to which he was tenderly attached. This sorrow almost unmanned him in tha midst of the perplexities of the past week, when he needed the utmost vigor to perform his duties. We know all that such a bereavement means, and can understand the depth of his affliction. We offer him our sympathy. There is One who sympathises with earthly sorrow deeper than we, and who can turn it into joy.

A Happy Man.

On the morning of January 5th an envelope of goodly proportions was laid on our desk. There could be no doubt of its errand. Some one had been made happy by that best of processes, making another happy. What we sow we reap. On opening it we were glad to see that it was no less than the announcement of the marriage of our friend Mr. A. S. Brown, the able and faithful manager of the operating department of the Western Union Company's office at 145 Broadway, New York, to Miss Annie M. Sheldon, of Milton, Mass. Mr. Brown is one of the men who bring honor to the profession by those qualities of mind and heart which inspire with confidence, and lead to absolute trust in their judgment and fidelity. We take pride in the pleasure of having many years ago appointed him to his present post. Its propriety and suitableness has never been challenged. He in fact elected himself by the proof of those qualifications which fitted him for the appointment. He has, since then, honored the selection, has preserved the discipline and effectiveness of the office by a discreet mingling of urbanity and authority, and was universally respected. It was a misfortune to the recent strikers, who so unreasonably made an issue with the company on utterly false grounds, that Mr. Brown was absent when they determined to drop their work. His influence might have averted a great evil to themselves, and a great wrong to the company. We wish Mr. Brown abundant happiness in his new relations, and hope that many years of honor and usefulness are before him.

Married.

Sperry—Keeler.—On Tuesday, January 11, by the Rev. Henry A. Cordo, J. H. Sperry, of the Auditor's Department, Western Union Telegraph Company, to Miss Fannie L. Keeler, both of New York.

Brown—Sheldon.—At Milton, on January 5, by the Rev. Dr. J. H. Morrison, M. Alfred S. Brown, of New York, to Miss Annie M. Sheldon, of Milton.

Born.

December 18th, at Union City, Ind., to Mrs. F., wife of W. T. Fleming, Manager Western Union office, a son, 6½ lbs.

Died.

In Brooklyn, Sunday morning, January 9th, of scarlet fever, Florence, only child of Albert B. and Marilla E. Chandler, aged two years and six months.

Working Arrangement of the Atlantic Cables.

London, Jan. 15.—It is announced to-day that a working arrangement between the Anglo-American, the Atlantic, the New York, Newfoundland and London, and the Societe du Cable Transatlantique Français Companies, has been agreed to. The arrangement is finally settled between the directors of the companies, and it only requires to be confirmed by the shareholders. The receipts of the three cables will be placed in a joint purse, and divided in the proportion of thirty-six and two-thirds to the Societe du Cable Transatlantique Français, and sixty-three and one-third between the Anglo-American, the Atlantic and the New York, Newfoundland and London Companies, Should any of the cables or the land lines in connection therewith be interrupted at any time, tha messages will be sent by the route which is open without regard to the company which may have accepted them. Thus the public will be benefited, whila the companies will have the advantage of their revenue being continued in the event of any of the cables being broken. It is also understood that the Anglo-American and the Atlantic Companies are to be reconstituted on the basis of a common stock.

The Hindrances to Electrical Communication.

SPEED OF TELEGRAPHIC SIGNALS.

To the Editor of the Springfield Republican:

In reply to the statement from the pamphlet of the National Telegraph Company, that 200 words per minute have been transmitted by the automatic process on one wire over a circuit of 2,000 miles, I would remark that this result is totally inconsistent with the well-established laws of electric transmission, and could not possibly have been accomplished upon any telegraph line of that length in existence, except by providential intervention. The statement, therefore, is either incorrect, or a miracle was wrought in aid of this particular experiment, which I am not prepared to admit. On the contrary, I deem it much more probable that an error was made in the experiment, and conclusions hastily jumped at which were not warranted by the facts.

A popular theory is entertained that electricity has a definite and practically instantaneous velocity irrespective of the medium through which it is transmitted. This idea, however, is entirely erroneous. This power, like all other forces in nature, is governed by the circumstances under which it is exerted, and its speed depends upon certain absolute conditions, among the principal of which are the length, size, quality and nature of the conductor through which it is transmitted. All substances are conductors of electricity, but differ extremely in degree. Thus the difference between the speed of electric transmissions of pure copper and gutta percha is two hundred million million million times, or about the same as that between the velocity of light and that of a body moving through one foot of space in six thousand seven hundred years. Electricity flows six times as fast through a long wire of pure copper as through an equally long iron wire of the same diameter, and with four times greater rapidity through an iron wire one-fourth of an inch in diameter than through one equally long but only half as thick. The property of the conductor, which determines the rapidity of the current, is termed the resistance: the greater the resistance the slower the speed and *vice versa*. The rapidity with which a succession of distant currents, such as are required to produce signals, can be made to follow each other through a telegraph wire is inversely proportional to the resistance of the conductor; and the resistance of conductors of the same material and of uniform thickness are in the direct ratio of their lengths. Thus a wire of a certain length offers twice the resistance of its half, thrice of its third, and so forth.

There is another element which greatly retards the speed of signaling through long telegraphic lines, called inductive embarrassment. A telegraphic line takes an electro-static charge, like a Leyden jar, the wire serving as the inner coating, the air as the glass or dielectric, and the earth as the outer coating. This statical charge shows that the electric force not only tends to propagate itself longitudinally, but laterally. The effect of lateral induction is to retard the time of delivery of a signal, and to prolong it, so that, although it is a momentary signal at starting, it becomes a prolonged signal at its destination, each signal at the receiving station taking a longer time to leave the line than it did to enter it. Hence in a very long land line, if the message is transmitted at the same rate as upon short lines, the signals will run into each other at the receiving station and be undistinguishable. Time must, therefore, be given to allow each signal to leave the line before another is sent.

Prof. Sir William Thomson, who was knighted for his services in connection with the Atlantic cables, and is justly considered one of the best electrical authorities in the world, states that the maximum speed obtainable on an aerial land line of 2,000 miles in length, consisting of an iron wire one-fourth of an inch in diameter (No. 3 Birmingham gauge), is twenty words per minute, and that the retardation increases with the square of the diameter of the wire. Thus, if a line be of the same length as another, but twice as thick, four times as many words may be sent by it. None of the land lines in this country are more than one-sixth of an inch in diameter (No. 8 Birmingham gauge), and in them the retardation of the current would be twice as great as in the line above-mentioned, and therefore, according to Prof. Thomson's data, the greatest possible rate of speed attainable upon a *single circuit of* 2,000 *miles of any line in this country is ten words per minute.* As practical results, however, always fall short of theoretical possibilities, even this rate of speed could not be attained in actual working, upon a single circuit of this length.

The effect of the retardation upon long land lines is overcome, in a measure, by dividing the wires at intermediate points and inserting Repeaters. For example, in working a wire from New York to Salt Lake City, it would be divided at Buffalo, Chicago and Omaha, and Repeaters inserted at each of those places, thus making a combined circuit of four sections of 500 miles each, instead of a single circuit of 2,000 miles; but when thus arranged, the rate of transmission does not average over twenty words per minute.

In a recent series of carefully conducted experiments with the automatic system, in which I employed chemically prepared paper of a very sensitive nature, I found that the highest rate of speed attainable through 400 miles of number eight iron wire did not exceed the ordinary rate of transmission by the Morse system. When I increased the speed of the instruments beyond this rate, the signals were prolonged to such an extent as to run into each other, and became unintelligible.

In view of these facts, I think it will be admitted that the statement in the pamphlet must be erroneous, and a reference to the manner in which the experiment was conducted will readily show how it occurred. Both the transmitting and receiving instruments were in the same room at New York, and were connected together by wires running to Boston and Philadelphia, representing a line 1,200 miles long, a resistance coil equal to 800 miles of wire being also inserted in the circuit to complete the 2,000 miles. The only evidence which the experimenters have that the current traversed 2,000 miles of wire is, that the writing produced by the transmitting instrument was reproduced on the receiving instrument—the most incontestible proof if the instruments had actually been 2,000 miles apart, but not altogether so conclusive when they were both in the same room. To effect the result accomplished, it was only necessary that a path should be open for the return of the current dispatched by the transmitter, and it will be seen that there was a much shorter one than that the current was supposed to have taken. It is stated that, when the experiment was made, there was a heavy rain storm prevailing. Now it is well-known that water is a comparatively good conductor of electricity, and that an electric current, when it has two channels, acts through each in proportion to the facility offered it. As the wet insulators presented many hundred times less resistance than 2,000 miles of wire, the current left the wire it was transmitted upon, followed the wet insulators to the wire connected with the receiving instrument, and thus returned to the office without having even left the city at all. Wet weather escape is a very common occurrence upon all telegraph lines, frequently producing results similar to the above, and which are familiarly known as "wet weather crosses."

The distance said to have been worked through by the automatic system—2,000 miles—is the same as between New York and Salt Lake City, and the battery used was twenty-eight cups, or the same as is employed to work a line of 250 miles in dry weather. So far from this battery having power to work a wire 2,000 miles long during a heavy rain storm, its force would be entirely exhausted in less than half that distance.

George B. Prescott.

New York, Jan. 4, 1870.

◆

Telegraphers' Mutual Life Insurance Association.

ASSESSMENT NO. 10.

James M. Foster,
C. D. Sprague, 10 and 11,
S. B. Greene,
J. H. Cade,
W. A. Tinker,
P. A. Smith,
P. H. Cooke,
J. H. Way,
A. F. Childs,
W. H. Fanning,
John M. Peters,
Harry J. Fleshe,
Joseph Elwyn Rowell.

◆

We are happy to be put in possession of No. 1 of the Philadelphia *Scientific Journal*. We have read over its items with much interest. They prove a discrimination in selection which must make the *Journal* welcome to all who think, or who desire useful gratifying knowledge. We wish it abundant success.

◆

A valuable system of fire-alarm telegraph has been introduced into Crosby's Opera House. A gong, below which is a board containing the numbers or names of all the rooms in the house, has been placed at the head of the main entrance, connecting by wires with a device in each room whereby when the temperature becomes excessive the gong is sounded, and the alarm conveyed to the Janitor—the exact location of the fire being indicated.

◆

A Telegraph Company has been organized at St. Johnsbury, Vt., with Franklin Fairbanks as president; Judge Saxe, of Sheldon, vice-president; and Calvin Morrill, treasurer. As soon as a capital stock of $20.000 is raised, work will be begun on the line which extends from Swanton to the Connecticut River.

◆

A few days since some infamous rascals sawed down the telegraph poles for about half a mile between Wescott and Rosemount, on the Milwaukee and Minneapolis railroad.

Executive Order No. 100.

TARIFF AND RULES FOR CUBA CABLE BUSINESS.

THIS ORDER CONTAINS COMPLETE INSTRUCTIONS IN RELATION TO CUBA CABLE BUSINESS, AND SUPERSEDES ALL PREVIOUS ORDERS ON THIS SUBJECT.

ALL MESSAGES MUST BE PREPAID.

TARIFF IN GOLD TO HAVANA.

	For 10 Words or less.	*Each additional word.*
From any Office in the United States, East of the Mississippi River, including St. Louis, Mo.	$5.00	.40
From any Office in the Provinces of Nova Scotia and New Brunswick	6.00	.50
From any Office West of the Mississippi River, excepting St. Louis, Mo.	7.50	.75

To places in Cuba other than the City of Havana, as per list below, an additional charge, in gold, must be made as follows:

For a Message of twenty Words, or less	$0.75
For each additional ten Words, or fraction thereof	0.25

LIST OF TELEGRAPHIC STATIONS IN CUBA.

Batabano.
Bejucal.
Bemba.
Bocu du Sagua.
Bayamo.
Consolacion del Sur.
Colon.
Cardenas.
Cienfuegos.
Caibarien.
Ciego de Avila.
Cuba.
Guanajay.
Guines.
Guaimaro.
Jiguani.
Los Palacios.
Los Tunas.
Matanzas.
Pinar del Rio.
Paso Real.
Puerto Principe.
Remedios.
San Antonio.
Santo Domingo (Colonfade).
Sagua.
Santi Spiritu.
Trinidad.
Union de Reyes.
Villaclara.

N. B.—Dispatches to points in Cuba, beyond Havana, are required by the Spanish Government to be written in the Spanish language. No responsibility will be taken on such messages, if forwarded in any other language.

RULES FOR CUBA CABLE BUSINESS.

Rule. 1.—Check. You will state in the check:

1. The number of words in the entire message, includin address, date and signature.

2. The amount charged.

Rule 2.—Count. The address, date and signature, must be included in the count, and charged for.

The name of the place where the message originates must be included in every message, to protect the several companies interested in its delivery. Should it be desired to send a message in which any of the above requirements are omitted, the sender must write below the message, "Responsibility of Delivery Waived," and sign the same name or names as in the signature of the dispatch. The prefix "B," must precede the check upon such messages.

F. O. B., or C. F. I., when written thus, "fob," "cfi," count as one word; but when the letters are separated thus: F. O. B., or C. F. I., count as three words.

Compound names of places, including names of countries, States, islands, cities, towns, &c., and compound words, count as one word. Names of individuals, firms, vessels, streets, and all other names count for as many words as they contain. The prefixes d' or de, and l', le or la, before names of individuals, will not be counted separately. In other cases they wil be charged as single words.

Figures in ordinary messages must be expressed in words. The charge will be for the number of words, without regard to the figures they represent.

Twopence, threepence, &c., up to elevenpence, count as one word in each case.

Words must be written in full. Abbreviations will not be allowed, except such as are in ordinary use, as Co. for Company, St. for Saint.

RULE 3.—Official Messages of the Spanish or United States Government will be charged less than the above rates by $1.75 for each message of ten words or less, and eighteen (18) cents for each additional word. All such messages must be signed officially, and the prefix "G" must precede the check.

RULE 4.—Code or cypher messages and abbreviations are disallowed by the Spanish Government.

RULE 5.—In messages to be mailed to West Indies, Gulf Ports and South America, the words "Post Havana" must be inserted and counted. Twenty cents gold must be charged extra for postage from Havana.

RULE 6—Repeated messages. In order to more effectually secure accuracy in transmission, messages may be repeated back from the station at which they have been received to the station from which they were originally sent. Repeated messages are charged double the ordinary rates.

The words "Repetition paid" must be inserted immediately after the address, and charged for.

Should the receiver of an ordinary message require it to be repeated on account of supposed error, the application for repetition must be addressed to the sending station. Such application and repetition must be treated as two distinct messages, and be prepaid by the applicant. Should an error be discovered, the charges for the application and repetition will be returned.

RULE 7.—Prepaid Replies. The sender of a message may prepay the reply as follows: The sender must insert immediately after the address, and pay therefor, the words "Reply, ——— words paid."

The number of words paid for will be written in the blank space. Should the reply contain more words than the number so specified, the sender of the reply, on presenting it for transmission, must pay for the excess. The reply must be tendered not later than eight days after arrival of original at delivery station.

If answer of only ten (10) words is prepaid, it is sufficient to insert in original message, "Reply paid."

In cases where more than one reply is required and prepaid, the sender must state the number of replies thus: "Three replies paid," or, if more than ten words, thus: "Three replies, each ——— words, paid."

RULE 8.—Government Cypher Messages may consist of numerals or letters, or both, and may contain plain dictionary words. They will be counted as follows;

1. Count plain words as single words.

2. Divide the total number of numerals or letters, if not in groups, by five (5), and count each five and fractional remainder as a word.

If grouped, count each group of five or less as one word; over five and up to ten, two words; and so on.

These rates are for unrepeated Government cypher messages, and no charges will be returned on account of errors. Double rates must be charged if these messages are requested by the sender to be repeated.

RULE 9.—Complaints. All complaints respecting irregularity in transmission or delivery of messages, must be made by the sender in writing. In cases of delay or error, the complaint must be accompanied by the receiver's copy of the message. In case of non-delivery, a statement in writing from the person to whom the message was addressed, to the effect that the message has not been received, must be furnished with the complaint.

WILLIAM ORTON, President.

TARIFF BUREAU.

Semi-Monthly Circular.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
JANUARY 15, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since January 1, the date of the last tariff order. Please note them in your tariff book:

NEW OFFICES.

383 Bolton, or Bolton's Depot, Miss., re-opened.
Can Station, Cal., 50 more than Cheyenne, Wy.
436 Murray Clark, Iowa.
330 Paducah Junc., Tenn.

OFFICES CLOSED.

Hazlehurst, Miss.
Morse's Station, Ky.

GENERAL INFORMATION.

The following is a list of offices to which orders will be given from time to time in this circular, under the heading "TO OFFICES HAVING SPECIAL SHEET A."

Such offices as have "Sheet A," but are not named below, will disregard all orders that may be given hereafter under the above mentioned heading.

Albany, N. Y.,
Albion, N. Y.,
Allegheny City, Pa.,
Allentown, Pa.,
Altona, Ill.,
Altoona, Pa.,
Amsterdam, N. Y.,
Anderson, Ind.,
Ashland, N. H.,
Ashtabula, Ohio,
Augusta, Me.,
Baldwinsville, N. Y.,
Baltimore, Md.,
Bangor, Me.,
Bath, Me.,
Belfast, Me.,
Bellefontaine, O.,
Belvidere, Ill.,
Bethlehem, Pa.,
Boston, Mass.,
Bowdoinham, Me.,
Bowling Green, Ky.,
Brady's Bend, Pa.,
Bridgeport, Conn.,
Bridgeport, Belmont Co., O.,
Brownsville, Tenn.,
Brunswick, Me.,
Buffalo, N. Y.,
Burlington, Iowa,
Cambridge, O.,
Camden, Me.,
Camden, N. J.,
Canton, Mo.,
Canton, O.,
Catasauqua, Pa.,
Chicago, Ill.,
Cincinnati, O.,
Clarksville, Tenn.,
Cleveland, O.,
Clinton, Iowa.,
Clyde, N. Y.,
Clyde, O.,
Coatesville, Pa.,
Columbia, Lancaster Co., Pa.
Columbus, Ohio,
Concord, N. H.,
Conneaut, O.,
Covington, Ky.,
Crown Point, Ind.,
Cumberland, Md.,
Damariscotta, Me.,
Davenport, Iowa,
Dayton, O.,
Des Moines, Iowa,
Detroit, Mich.,
Dubuque, Iowa,
Dunkirk, N. Y.,
Dunleith, Ill.,
E. Liberty, Pa.,
Easton, Pa.,
Eaton, O.,
Elgin, Ill.,
Elizabeth, N. J.,
Elyria, O.,
Erie, Pa.,
Fair Haven, Conn.,
Little Falls, N. Y.,
Lockport, N. Y.
Logansport, Ind.,
Louisville, Ky.,
Lowell, Mass.,
Lynn, Mass.,
Lyons, N. Y.,
Madison, O.,
Manchester, N. H.,
Marion, O.,
Mauch Chunk, Pa.,
Mechanicsburg, Pa.,
Medina, N. Y.,
Meredith Village, N. H.,
Memphis, Tenn.,
Middletown, Conn.,
Middletown, O.,
Miller Farm, Pa.,
Milwaukee, Wis.,
Minooka, Ill.,
Moline, Ill.,
Monmouth, Ill.,
Monroe, Mich.,
Morris, Ill.,
Mt. Carmel, Pa.,
Nashua, N. H.,
Nashville, Tenn.,
New Albany, Ind.,
Newark, N. J.,
New Britain, Conn.,
New Brunswick, N. J.,
Newburyport, Mass.,
New Haven, Conn.,
New York City, N. Y.,
Niagara Falls, N. Y.,
Norristown, Pa.,
North East, Pa.,
North Judson, Ind.,
Norwalk, Conn.,
Norwich, Conn.,
Oil City, Pa.,
Oneida, Ill.,
Oneida, N. Y.,
Owego, N. Y.,
Ottawa, Ill.,
Painesville, O.,
Palmyra, Mo.,
Palmyra, N. Y.,
Paris, Tenn.,
Parker's Landing, Pa.,
Perrysburg, O.,
Peru, Ill.,
Petroleum Centre, Pa.,
Philadelphia, Pa.,
Piqua, O.,
Pittsburgh, Pa.,
Pittston, Pa.,
Pleasantville, Pa.,
Pottstown, Pa.,
Poughkeepsie, N. Y.,
Portland, Me.,
Portsmouth, N. H.,
Princeton, Ill.,
Providence, R. I.,
Quincy, Ill.,
Racine, Wis.,
Fairmont, W. Va.,
Fairport, N. Y.,
Fishersville, N. H.,
Fort Madison, Iowa,
Fort Plain, N. Y.,
Frankfort, Ky.,
Franklin, N. H.,
Franklin, Pa.,
Freemansburg, Pa.,
Fremont, O.,
Fulton, N. Y.,
Galena, Ill.,
Galesburg, Ill.,
Galva, Ill.,
Gardiner, Me.,
Georgetown, D. C.
Gettysburg, Pa.,
Greensburg, Pa.,
Greenville, O.,
Hagerstown, Md.,
Hallowell, Me.,
Hamilton, O.,
Hancock, Md.,
Hannibal, Mo.,
Harrisburg, Pa.,
Hartford, Conn.,
Hazleton, Pa.,
Hebron, Ind.,
Hellertown, Pa.,
Hooksett, N. H.,
Hudson, N. Y.,
Huntingdon, Pa.,
Ilion, N. Y.,
Indianapolis, Ind.,
Iowa City, Iowa,
Jeffersonville, Ind.,
Jersey City, N. J.,
Johnstown, Pa.,
Joliet, Ill.,
Kenosha, Wis.,
Keokuk, Iowa,
Kewanee, Ill.,
Kittanning, Pa.,
Kokomo, Ind.,
Laconia, N. H.,
Lafayette, Ind.,
Lagrange, Mo.,
Lake Village, N. H.,
Lambertville, N. J.,
Lancaster, Pa.,
La Salle, Ill.,
Lebanon, Pa.,
Lewiston, Pa.,
Lexington, Ky.,
Reading, Pa.,
Rhinebeck, N. Y.,
Richmond, Ind.,
Richmond, Me.,
Rochester, N. Y.,
Rockford, Ill.,
Rock Island, Ill.,
Rockland, Me.,
Rockport, Me.,
Rome, N. Y.,
Rouseville, Pa.,
Royal Centre, Ind.,
Saco, Me.,
St. Louis, Mo.,
Salem, Mass.,
Sanbornton Bridge, N. H.,
Sandusky, O.,
Schenectady, N. Y.,
Scranton, Pa.,
Springfield, Mass.,
Springfield, O.,
Stoneham, Mass.,
Suspension Bridge, N. Y.,
Syracuse, N. Y.,
Tan Farm, Pa.,
Thomaston, Me.,
Tiffin, O.,
Tiskilwa, Ill.,
Titusville, Pa.,
Toledo, O.,
Trenton, N. J.,
Troy, N. Y.,
Union City, Ind.,
Union Stock Yards, Ill.,
Urbana, O.,
Utica, N. Y.,
Waldoboro, Me.,
Warren, Ill.,
Warsaw, Ill.,
Washington, D. C.,
Washington, G. Co., O.,
Washington, Pa.,
Waterbury, Conn.,
Waukegan, Ill.,
Wheeling, W. Va.,
White Haven, Pa.,
Wilkesbarre, Pa.,
Winchester, Mass.,
Winterport, Me.,
Wiscasset, Me.,
Woburn, Mass.,
Worcester, Mass.,
Wyanet, Ill.,
Xenia, O.,
Zanesville, O.

WILLIAM ORTON, President.

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Night Offices.

For the convenience of several managers who have requested it, we give the names of night offices of which official notice has been given through the JOURNAL:

New York,
Philadelphia,
Baltimore,
Washington,
Richmond, Va.,
Wilmington, N. C.,
Charleston, S. C.,
Augusta, Ga.,
Savannah, Ga.,
Montgomery,
Mobile,
New Orleans,
Memphis,
Nashville,
Louisville,
Cincinnati,
St. Louis,
Omaha,
Chicago,
Milwaukee,
Detroit,
Pittsburgh,
Toledo,
Indianapolis,
Cleveland,
Buffalo,
Rochester,
Syracuse,
Utica,
Troy,
Albany,
Boston,
Providence, R.
Bangor, Me.,
Bath, Me.,
Portland, Me.,
Hartford, Conn.,
New Haven, Conn.,
Worcester, Mass.,
Springfield, Mass.,
Columbus, O.,
Scranton, Pa.,
East Liberty, Pa.,
Fall River, Mass.,
Columbus, Ga.,
Vicksburg, Miss.,
Parkersburgh, W. Va.,
Cumberland, Md.,
Wheeling, W. Va.,
Macon, Ga.,
Lafayette, Ind.,
Terre Haute, Ind.,
Evansville, Ind.,
Dayton, O.,
Newark, O.,
Xenia, O.,
Zanesville, O.

Bolton's Telegraph Code.

[From the Anglo American.]

To comprehend this Code the fact must not be overlooked that the electric current along the wire admits but of two signs, the dot and the dash, the one being but a prolongation of the other. The question Major Bolton has undertaken to solve, is, how best to apply them. In the word "best" is implied speed, as the telegraph means time; accuracy, for the message is worse than worthless if incorrect; universality, for the globe is the field and the wire is the true bond of brotherhood. Morse, out of his dot and dash, constructed the alphabet now in use. He has five dots for his first five numerals, and five dashes representing 6 to 0. Morse's alphabet is, as we said, . — for A. which, according to Bolton's Code, is 16, therefore 16 is A; — . . . means B by Morse's alphabet, by the Code it is 63, therefore 63 is B; — . —. means C, and in the Code 6161, hence these figures represent the letter, and so on. The Code therefore takes in Morse's alphabet to be employed when required. Thus the system is made so comprehensive that it embodies everything now used, while confining itself to the numerals as symbols. In applying this Code to the main consideration, time, it must be explained that spaces, of which there are three, are almost as valuable in transmitting messages as symbols. The first space separates the elements of a letter; the second, the letters of a word; the third, the words themselves. The duration of a dot is the unit of length, and the dash equals three dots. The first is the unit, the second is the dash or three dots, and the third is equal to six dots. In submarine lines the dot increases in length, indeed in equalling the dash on short open air lines. Bad spaces causes most of the operator's blunders; hence whatever reduces the number of spaces tends as well to accuracy, though more still towards economising time. The numerals cannot fail to be more simple, being confined to ten, than are the letters, consisting of 26, while stops, parentheses, accents, will also, in a measure, be done away with by the Code. But Bolton's system does not only leave the alphabet as now in use for those who require it, but increases its utility, both by giving whole all the small words frequently occurring, as and, the, but, and by giving double letters, as 454 M, 455 M', 456 Ma, 457 Mb, 458 Mc, carrying the alphabet through the whole, each letter in capitals being printed in conjunction with every other letter of the alphabet, enabling the operator to send double letters, whereby half the time is saved. Such a code is applicable to the globe, as numerals are universal, all required being to interpret the English signification of the number into that of any other language. The Post-Office, soon after the 1st of next month, will have wires ramifying to every sub-money-order office, so that in a village or in any street of the metropolis a man's chemist or stationer may be his transmitter of a message, and this fact will have an amazing influence in checking the free use of the wire. Families recoil from carrying into a shop a message which tells more of home affairs than they desire should be openly discussed. Worse still, in the sender's mind will arise the question, "How will neighbor Jones interpret this?" If the return home of a husband is earnestly desired, two ideas may suggest themselves to neighbor Jones. 1st, that the husband is out on a spree; 2d, that an execution is in his house. If a case of champagne be telegraphed for, that extravagant fellow is not the man to be trusted. Indeed it may be safely predicted that secrecy in the transmission of messages, with cheapness, are the vital principles for government action if it desires to make a thorough success of its management.

SPECIAL NOTICE.

GRAY & BARTON,

(Manufacturers for the American Private Line Telegraph Company.)

Beg leave to announce that they have removed their Chicago works from 162 South Water Street to

No. 13 LaSALLE STREET,

And have added thereto a large amount of new Machinery and Tools, especially adapted to the manufacture of all

TELEGRAPH AND ELECTRICAL INSTRUMENTS.

They are prepared to supply orders for

MACHINERY OR TELEGRAPH SUPPLIES

of all kinds and descriptions at brief notice.

Our machinery will be of the latest and most approved designs, and special advantages have been secured for furnishing instruments of the patterns of the Caton and Western Union Shops, the high reputation of which will not suffer at our hands.

We call the attention of all interested in the working of Telegraph Lines to the fact that we make first-class RELAYS with a resistance of only from six to twelve miles, and make no Main Line Magnets with high resistance except to order.

Hereafter all our Relays will have the resistance of each instrument accurately measured and marked on the base.

SOMETHING WORTH HAVING.

SPLENDID CHROMOS OF
GRANT, LINCOLN AND SEYMOUR,
AT LOWER PRICES THAN EVER BEFORE OFFERED.

LINCOLN, 9x11 .... 50 cents.
GRANT, 9x11 .... 50 "
SEYMOUR, 8x10 .... 30 "

Sent Single on receipt of the price to any address, postpaid.
The three Chromos sent postpaid on receipt of $1.
Address— T. J. HYATT,
(Office of John Polhemus,) 102 Nassau Street, New York.

Defrauding the Company.

New York, Dec. 17, 1869.

Editor Journal of the Telegraph:

Dear Sir—Cases like the following have been frequently noticed by me, and I doubt not by others.

C. & J. telegraph from ——, Dec. 13, as follows, to B. & J., New York:

Ship, by express, twenty-four pair, eight by ten, number four. Signed C. & J. No answer is requested. Four days later, the goods not having arrived, and C. & J. being anxious to know when they were shipped, the —— office telegraphs New York, as follows: Please get answer to message 13th, to B. & J. Signed C. & J. Please hurry it. B. & J. refuses to answer; they have written. Which fact has to be telegraphed back to ——, and C. & J. get the information gratis.

Now, in the above transaction, is not the company defrauded by its own servants, out of at least one toll?

E. J. B.

[The above can scarcely be classed among the list of frauds. An answer cannot always be given by telegraph, and a telegraph company must be courteous and obliging. That there is a large number of inquiry messages uselessly sent, there can be no doubt. It requires discretion, and good sense, to decide how far to yield to the anxieties and curiosity of those who forward messages. The rule that all undeliverable messages be reported, should lessen inquiry as to unanswered messages, as silence would be regarded as delivery.]

FRANK L. POPE,
TELEGRAPHIC AND ELECTRICAL ENGINEER,
Nos. 78 and 80 Broadway, Room 48,
NEW YORK.

AMERICAN FIRE ALARM
AND
POLICE TELEGRAPH.
GAMEWELL & CO., Proprietors,
NO. 104 CENTRE STREET, NEW YORK.

This system of Fire Alarm Telegraph, with a central office, or upon the

AUTOMATIC PLAN,

is now in operation in the following cities, to which reference is made for evidence of its great superiority and value, and uniform reliability:

BOSTON,
CHICAGO,
PHILADELPHIA,
CINCINNATI,
ST. LOUIS,
BUFFALO,
BALTIMORE,
MOBILE,
NEW ORLEANS,
PITTSBURG,
LOUISVILLE,
ALLEGHENY,
MONTREAL,
QUEBEC,
PORTLAND,
ST. JOHN, N. B.,
HARTFORD,
TROY,
NEW HAVEN,
ROCHESTER,
SPRINGFIELD,
TOLEDO,
ALBANY,
COLUMBUS,
LAWRENCE,
MILWAUKEE,
SAN FRANCISCO,
CAMBRIDGE,
WASHINGTON, D. C.

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◆

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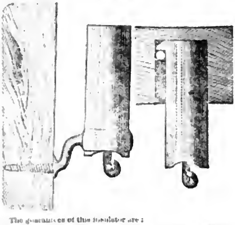

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JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 5. NEW YORK, FEBRUARY 1, 1870. WHOLE NO. 54.

The Maddening Mechanism of Thought.

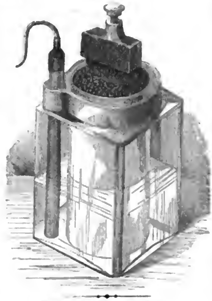
Our brains are seventy year clocks. The Angel of Life winds them up once for all, then closes the case, and gives the key into the hand of the Angel of Resurrection. Tic-tac! tic tac! go the wheels of thought; our will cannot stop them; they cannot stop themselves; sleep cannot still them; madness only makes them go faster; death alone can break into the case, and seizing the ever swinging pendulum, which we call the heart, silence at last the clicking of the terrible escapement we have carried so long beneath our wrinkled foreheads. If we could only get at them, as we lie on our pillows and count the dead beats of thought after thought, and image after image jarring through the overtired organ. Will nobody block those wheels, uncouple that pinion, cut the string that holds these weights, blow up the infernal machine with gunpowder? What a passion comes over us sometimes for silence and rest, that this dreadful mechanism, unwinding the endless tapestry of time, embroidered with spectral figures of life and death, could have but one brief holiday. Who can wonder that men swing themselves off from beams in hempen lassos, that they jump off from parapets into the swift and gurgling waters beneath, that they take counsel of the grim fiend who has but to utter his one peremptory monosyllable, and the restless machine is shivered as a case that is dashed upon a marble floor. Under that building which we pass every day there are strong dungeons, where neither hook, nor bar, nor bed cord, nor drinking vessel from which a sharp fragment may be shattered, shall by any chance be seen. There is nothing for it, when the brain is on fire with the whirling of its wheels, but to spring against the stone wall and silence them with one crash. Ah, they remember that—the kind city fathers—and the walls are nicely padded, so that one can take such exercise as he likes without damaging himself. If anybody would really contrive some kind of a lever that one could thrust among the works of this horrid automaton and check them, or alter their rate of going, what would the world give for the discovery. Men are very apt to try to get at the machine by some indirect system or other. They clap on the brakes by means of opium, they change the maddening monotony of the rhythm by means of fermented liquors. It is because the brain is locked up and we cannot touch its movements directly, that we thrust these coarse tools in through any crevice by which they may reach the interior, alter its rate of going for a while, and at last spoil the machine.—*Oliver Wendell Holmes.*

◆

A WRITER in the *Scientific American* suggests the use of the Morse alphabet for the use of deaf mutes in the dark, using the finger as the key is used in transmission. To persons who occupy apartments on different floors of the same house, connected by a common gas pipe, communication is easily maintained in this way.

The Leclanche Battery.

A complete description of this battery having been given in preceding numbers of the JOURNAL, we present an illustration of the Leclanche cell, as we find it in the London *Chemical News*, and which has been handsomely engraved for us by Mr. A. L. Langridge, of 132 Nassau street. The main feature of this battery is in the use of peroxyde of manganese with zinc and a solution of the chloride of ammonium. Its advantage is stated to be in its constancy and lengthened retention of power, and is recommended by European experts and by the news for telegraph batteries. Peroxyde of manganese, possessing in a high degree inoxydability, insolubility, and great affinity for the combustible bodies, only one liquid is found necessary, and the action is good, steady, and prolonged.



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Velocity of Electric Wave.

Professor Gould found the velocity of the electric wave in the Atlantic cable to be between 7,000 and 8,000 miles per second, differing somewhat when the circuit was composed of the two cables, and when the earth formed a part of the circuit. Telegraph wires placed in the air on poles conduct the electric wave with about double the above velocity, and the curious fact has been discovered that the rapidity of transmission increases with the distance of the wire from the earth. Wires buried in the ground transmit as slowly as the submarine cables; wires on short poles with a velocity of some 12,000 miles per second, and those on long poles at the rate of 16,000 to 20,000 miles, per second.

Telegraph Strikes—A Reminiscence of the Rebellion.

[From the Louisville Courier-Journal.]

The recent strike of the telegraph operators all over the country, which has just ended by the telegraphers agreeing to return to their work, has recalled to mind the first and only previous strike of operators in this country. It occurred in the Southern Confederacy, and ended most ingloriously for the operators.

In the fall of 1863, the operators in the employment of the Southern Telegraph Company, which extended from Richmond to Mobile, were paid $500 per month in Confederate money. Board cost $400 per month, a pair of boots $200, a suit of clothes $700, and other articles in proportion, and the operators, even with the strictest economy, were unable to live comfortably. A protective league was organized, and they resolved to strike for an increase of salaries. At that time operators were exempted from the action of the conscript law by a special act of Congress, and, as their services as operators were imperatively necessary to the government, they were confident of obtaining an easy victory. By some means the intentions of the strikers were made known to the managers of the company. The clause exempting operators from military duty was repealed, and, on the day that the strike was announced, in fact, almost at the very moment, a squad of soldiers entered each office on the line, captured the telegraphers under authority of the conscript law, and swore them into the service. They were immediately detailed for special duty as operators at private soldiers' pay—$17 per month and one ration per day of sour corn meal and musty bacon. They of course yielded at once, but the managers were inexorable, and they were compelled to serve as high privates for several months.

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To preserve our record complete, we print the following card from Mr. Mumford, which appeared in the San Francisco News Letter and received by us too late for publication:

"THE TELEGRAPH MATTER.

"EDITOR NEWS LETTER:—As the telegraph operators' strike, which originated here, has extended over the entire country, and as misrepresentations of every sort have been circulated with regard to it to mislead both telegraphers and the public, I give the following statement of the exact facts in the case:

"About the middle of December, Mr. Gamble, Superintendent, notified two operators in the San Francisco office that after the first of January their salaries would be reduced $5 each, making their pay $115 per month instead of $120, and notified a third that his salary would be raised from $100 to $120. This was the origin of the difficulty. The proposed change was deemed by the Superintendent proper and fair. Instead of decreasing the amount paid by the company in its operating department, it actually increased it $10 per month.

"A few days ago a petition was presented from most of the San Francisco operators asking me to accept a subjoined list of salaries. This list revoked the two $5 reductions, and increased the salaries paid four others, but made no further change in the pay roll. In reply to the petition the operators were informed that no increase of the aggregate amount then paid in their department could be assented to, as business was dull, receipts light, and the number of messages transmitted fewer than usual; that the force employed in the office was larger than required and that I had intended to reduce it from the first of January. It was admitted that more men were employed than were strictly necessary. Notice was then given, in reply to the petition, of the schedule of salaries which would take effect after the first of January. By this schedule no salary was reduced. On the contrary the only changes were increases, several men being given the full amount asked for in the petition. At the same time two were notified of their discharge. They were informed that this action was taken to reduce the force to existing requirements of the business, but that they were selected for dismissal because I was satisfied they were doing all in their power to create mischief, discontent and bad feeling in the office.

"It will be seen therefore that no reduction of the scale of compensation to operators was ever proposed, and that whether proposed or not the two $5 changes were never carried into effect, one man being retained at $120, and the other dismissed.

"After the discharge of the two parties mentioned, a third was dismissed because he refused to work for the salary assigned him by the schedule. This was $10 more per month than he had ever got before.

"Out of this capital the strike arose. Four men left this office. Most of the operators in Sacramento and Virginia declined to work unless permitted to do so by those here who were leagued with them in a secret society under oath. They were informed that if they had any grievances of their own they would be promptly redressed, but that this company did not recognize in the ordinary course of its business any right of supervision on their part over the affairs of other offices, or of dictation in regard to them. They were notified that they must agree to attend to their own duties or be discharged. They refused and were dismissed.

"The company still retains a sufficient number of men to fully attend to its business. More are applying for situations every day, and no one who has joined in this utterly unjustifiable movement will ever be allowed to return.

"Geo. H. Mumford,
"Gen. Agent Western Union Telegraph Co."

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OPINIONS OF THE PRESS.

(From the New York World.)

THE TELEGRAPH OPERATORS' STRIKE.

Telegraph operators are commonly a more intelligent class than so-called workingmen, yet there has been for many months among the latter class no strike so needless and so incapable to command public sympathy as this of the former class, on their own showing, appears to be.

The right of telegraph operators, or any other wage-receivers, to combine to resist a reduction of wages, or to obtain an increase of wages, we do not dispute, but, on the contrary, would uphold, if it were powerfully disputed. This right, however, is not to be dissociated from their duty not to inflict such evil upon themselves and inconvenience upon the public as they are now inflicting without sufficient and certain cause. It cannot have been the duty of the operators' organization to order a strike before every reasonable attempt was made to effect with their employers a fair conciliation of differences. It can never be the duty of that or any other similar organization to claim, as they implicitly claim, exclusive power to settle the amount of work they will receive or wages they will pay.

Wage-receivers in this country will never advance themselves to the position of strength and public respect which they should deserve and receive, until they can learn to consider themselves as but one of two parties to a bargain—entitled, indeed, to an equal voice which only the power to combine, and to strike work if need be, can render audible to narrow-minded and avaricious employers, but not entitled to more than an equal voice, not entitled to an exclusive voice. The workingmen of Great Britain understand their interests better. Strikes are there growing more unfrequent every year; courts of conciliation or arbitrament are multiplying.

On the state of facts disclosed by the operators for themselves, and by the company for itself, public sympathy, which is reasoning and desires to be just, will go with the company. The officers of the company scarcely claim what they are entitled to claim—a right to have half a voice on the question of wages and work. They claim the right to an exclusive voice on the question of how many men in this office, how few men in that, o thrifty conduct of their business enjoins them to employ. Under the limitation suggested, that the relation of wages to work where they have but half a voice remains unaltered, this exclusive right cannot be denied them by operators or anybody else. It is needful to the good management of their business, is an essentially cardinal part of it. It is the hinge of profit or loss. As towards wage-receivers, it may be regarded as analogous to the right maintained by them of withdrawing many men from work, under the constraint of organization, who would prefer in their own private interest to continue work at wages repudiated by the striking authority.

From the New York Evening Post.

It seems to us that the strikers have acted upon a confused notion of the facts; that the company has done right to resist their unreasonable demands, and that it could do no less. The men who have struck have no right to the sympathies of the public.

(From the New York Times.)

THE TELEGRAPHERS' STRIKE.

We are reluctant to again offer a few words upon the telegraphers' strike, but duty and good feeling alike refuse us the privilege of silence. Are, then, the employes of the Western Union Company, who have thrown up their situations, aware of the real nature of the movement in which they have been driven to participate? Nor is the word "driven" inappropriate to the situation, for the "League" appears to exercise as absolute control over the telegraphers as could any tyrannical system on earth. The case, however, is tolerably clear by this time, and will be understood as follows:

A secret society—not, be it observed, an open and above-board trades' union or protective society—is organized for the purpose of secretly controlling the telegraphing business of this country, and of taking possession of the individual rights and liberties of all the operators. To show the true meaning and intent of this design, it is only necessary to say that the rules require each member to take an oath to perform his whole duty to his employers, "provided he does not conflict with a duly authorized order from the chief of the circuit to which he belongs." He must further not obey an order from his employer to remove to some new station without permission from the said chief. The oath further provides that the member shall make common cause with the League, and "forsaking your allegiance to corporations or individuals," be at the disposal of the officers of the League. The operators have thus joined an organization which in reality takes away every shred of independence which they ever possessed. It places them entirely at the mercy of men who are in effect irresponsible, and may order suspension of work, and perhaps the acceptance of poverty, at their own will and pleasure.

Of course the promoters of the strike claim that there was cause for their action, but what does the claim amount to when thoroughly sifted? The San Francisco office was over-supplied with operators, and some reorganization was resorted to, as would be the case in any other business. Upon such occasions salaries come of course under revision, as well as positions. Mr. Jacobs was found to be unnecessary, and was dispensed with. A new scale of salaries was framed, by which *none* were reduced, but several increased. Upon this, Mr. Jacobs wrote what was untrue, that reductions were taking place on the Pacific coast, and implying that resistance was called for. And upon this slender thread the whole case for the operators hangs.

Now, it must be evident that a League under whose influence hundreds of deserving men and women can be thrown upon the world, almost without warning, can be no friend to the operators. Still less can the latter expect that the business can continue to be embarrassed by the possibility of future obstructions at the dictation of a secret committee. We are glad to see that the Telegraph Company is willing to forget the past, and to receive and protect their absent employes—a fact which ought to dispose of all charges of injustice or ill-feeling towards them. Their real friends will counsel them to end this ill-judged proceeding, and vindicate their own dignity by throwing off allegiance, not to their employers and their profession, but to a League which ought never to have been countenanced.

A ROD FOR THE FOOL'S BACK.

(From the San Francisco News.)

How will it end? Precisely as similar movements have ended, now end and will end, until the celestial party whose name has escaped us shall straddle the sea-shore and announce that Time shall be no more. The industrial history of the country is a record of the strikes of operatives, supplemented with a coextensive record of their failures. This ancient and honorable method of obtaining redress for grievances has been a tolerably constant illustration of the reflex action of the novice's boomerang, and if the irreconcilables of the Western Union Telegraph succeed in imparting to their weapon an initial velocity greater than ordinary it will only come back at them with the more vicious hurtle. An authoritative statement in another column gives a clear idea of the infinite wrong and infinitessimal right for which these doughty operators abandon their clicking instruments and go forth to do battle with the employers upon whose bread they have waxed fat and arrogant. There is something essentially mean and dishonest in this strike; a dense blindness of conceit, an intensity of impudence, that has found its parallel only in the eight-hour movement and the anti-coolie iniquity. That any employe has the right to interfere in a matter concerning only his employer and another operative, and dictate terms upon which the latter may be allowed to work, is so fixed a principle in the mind of the working man that centuries of argument have been unable to remove it. It is the fundamental article of his moral code, for which he is always ready to lay down his tools if not his life, and it is only by bitter experience that he ever learns the impolicy of resorting to his cherished villainy. For his own good it is best that the lesson should be taught him sharply and unmistakably. To temporize, to parley and "palaver" is absurd and suicidal. Employers of people belonging to the banditti of trades unions should keep a rod in pickle for these gentlemen, and not hesitate to lay it on for the production of wholesome welts. The Telegraph Company have taken a firm grasp of this bull's horns, and we hope to see Wells Fargo, the Pacific Mail, and all other concerns go and do likewise should Taurus lower his front at their business interests. We are tired of hearing about the inherent right of men to quit work when they choose. No man has a right to prostrate the business of his employer for the redress of any one's grievance but his own; and a kind Providence has so ordered it that when he seeks to do so he is himself the prostrated party. And we joy to see him down.

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Petroleum oil lamps are affected by music, a certain note on a brass instrument putting them out. M. Duhen, of Brussels, extinguished eight lamps in succession by the sound of a trumpet.

Correspondence.

Aspinwall, December, 15, 1869.

EDITOR JOURNAL OF THE TELEGRAPH :

When I see the crowds of emigrants that are still flocking to the Golden States of the Pacific, memory brings to recollection the hopes, struggles, and bitter dissapointments experienced there ; the many happy hours spent around the camp fires of California, and the castles of fancy, that have long since faded into thin, very thin air.

Aspinwall is calm and quiet. The only signs of industry recently observable, are the desperate and indefatigable efforts of the agile youth to master the eccentric movements of velocipedes. Recently, I tried to propel one, and regret to acknowledge that my efforts were not rewarded with any flattering success. The "critter" isn't like a bucking Californian horse, that jumps stiff-legged, rears and falls backwards, to the imminent peril of its rider. There's some fun in that, and the attendant danger may be overcome until the mustang is taught to behave himself. But the bicycle has a provoking way of tumbling over on its side, in spite of the most strenuous efforts to keep it in motion and preserve its equilibrium. Although obliged to confess that my own exertions resulted in a failure, the individual who imports these queer machines deserves thanks, because some of us may get our muscles and mental capacities, so developed as to hereafter be able to work our way far enough into the "dignity of labor" as to defeat the desire to continue a life of laziness.

The benighted and turbulent race that once swayed its sceptre over this nature favored region, and appreciatively wandered over its agricultural wealth, is fast disappearing before advancing civilization. The miserable remnant of that mischievous race, which yet lingers and skulks around its old haunts, is too insignificant to delay the rapid step of progress. When the proposed Ship Canal is completed, Aspinwall will be considered the "Hub of the Universe," not Boston.

At the present time, however, there are many vacant dwellings in the rural districts. There are few more melancholy objects among inanimate things, than a deserted house.

It is the tomb of buried hopes, the mausoleum of old memories, the crumbling depository of few joys and many privations, a sad memorial of things that were and cannot be again.

The other night, while in my hammock, listening to the splashing of the waves, as they broke over the reefs, and to the gentle winds sighing through the branches of the tall cocoa nut trees, like whisperings from the spirit land, and watching the blue wreaths of smoke ascending from a fragrant Havana, the question occurred to my mind. "Santiago, old boy, where will your restless brain find peace and oblivion? Where will your carcass be deposited in its final resting place?" and although the interrogation remained unanswered, it set me to thinking of various melancholy subjects, among which is the universal improvidence of telegraph operators, which must impress itself upon any observing mind.

Some inexplicable reason causes the majority to take for their motto "Sufficient unto the day is the evil thereof," and the thought that such a course of life is selfish and useless, never seems to strike their minds.

There are few men who do not, when the painful struggles of life are ended, leave some one to mourn their loss ; in many cases with too good cause, and it surely cannot add to the love of those who survive us if we leave them to battle with the hardships of life, when by the exercise of a little forethought and trivial economy, so much misery might have been spared them. By the sacrifice of a single cigar per diem, a handsome provision might be made for our families, and the innumerable miseries of poverty averted, by availing ourselves of the aid of Life Insurance.

How many of us have known instances where the main stay of a family has been suddenly called away, and a helpless widow and orphans left to encounter want and sorrow, with no claim upon any one for assistance, except that of charity ; no friend save Him to whom all should turn for help through prayer. Somehow or other, we are apt to forget all about praying, while assistance is not imperatively required, and as for earthly aid, the few dollars given to penniless kin, are usually doled out with bad grace! The remedy for all this, lies in our own hands. It must be a great comfort to a dying man to know that he leaves his loved ones well provided for against the hardships of life, and such satisfaction cannot be secured in any other way at so trifling expense, as by Life Insurance. In fact there are few institutions so beneficial to mankind, and none have done more to provide for the widow and the orphan, and comfort the afflicted. Hence there is no good reason why all operators should not insure now in the "Telegraphers Mutual" instead of procrastinating until the opportunity is lost, and it is, alas! too late!

In conclusion, I desire to remind all my friends in the "profession," (who may perhaps recognize the writer, in spite of the *sobriquet*), of Burns' lines :

> "Tho' I to foreign lands must hie,
> Pursuing fortunes slipping ba'—
> With melting heart, and brimful eye,
> I'll mind ye all. Tho' far awa."

Hasta luego!

SANTIAGO.

Manufacture of the Points of Needles and Pins by Electricity.

BY C. WIDEMANN.

A recent discovery has been made by M. Caudery, telegraph inspector on the Western Swiss Railroad, and is now applied with success at Aix la Chapelle, Belgium, whence needles and pins are shipped to all parts of the world.

In establishing an electrical current by means of a small Bunsen battery, and by passing a metallic wire (brass, copper, iron, or steel), corresponding with the negative pole, through the bottom of a glass tube, closed in such a way as to contain an acidulated liquid, in leading the other wire of the positive pole through the superior opening of the glass tube, closed in such a way as to allow the positive wire to plunge into this acidulated liquid, taking care to leave a small interval between the extremities of the wires ; the electric current thus established through the acidulated fluid as a conductor, produces the following phenomena :

Very soon the extremity of the positive wire takes a conical point of more or less sharpness, depending on the free distance existing between the two wires plunging into the acidulated liquid.

During this phenomenon, which takes from 5 to 15 minutes, according to the acid used, its strength, the composition of the wire, its degree of thickness, and also the intensity of the electric current, very fine sections of the wire are seen to separate from the wire.

Water, acidulated with sulphuric acid, appears to be more efficacious, especially for iron and steel wires.

Nitric acid is used in preference for brass and copper wire.

The same effect will take place if to the positive pole (superior) an indefinite number of wires are tied together and dipped in the acidulated water, instead of the single wire, care being always taken to keep this positive wire at a little distance from the negative wire.

I have seen a hundred brass wires after having been submitted to this operation, present points as sharp as the best English pins, although the electric current was produced by a very small Bunsen battery.

It appears to me very desirable that this new method should receive proper encouragement, and everything should be tried to bring it into general use. The operation of making the points of needles and pins in their manufacture is a dangerous and costly one. Medical men in large manufacturing cities have long recognized the dangerous effects produced by the fine metallic dust resulting from it on the health of the workmen.

The remedies for this evil are very imperfect, little used, and very impracticable ; inhaling apparatus communicating with the outside air has been tried, but every danger would be suppressed by the method above described. — *Scientific American.*

PRESENTATION.—Christmas morning the general office of the Western Union Railroad, was the scene of one of those pleasant hours that make life's journey passable. E. O. Wait, Superintendent of Telegraph, sat intently listening to the ticking of his instrument, perhaps it was a "Merry Christmas," from some friend a hundred miles away, perhaps something about business—the sound of that instrument conveys no intelligence to our ears—when from the crowd that had assembled at the office, R. W. Evans stepped forth, and arresting Mr. Wait, addressed him as follows :

MR. WAIT :—Your friends having you in mind, wish to express their appreciation of your excellent management of the Western Union Railroad Telegraph Department. We, the operators, and your associates in the employ of the Western Union Railroad, take this opportunity to give you a Christmas gift, this beautiful silver watch ; we give it to you not for its intrinsic value, but for its imperishable nature, that it may be engraven on the tablets of your memory as a token of our friendship and esteem.

At the conclusion of his remarks, Mr. Evans presented Mr. Wait with a splendid American watch. To say that Mr. Wait was beat would not do proper justice to that gentleman's feelings : we were unable to catch his remarks ; indeed, we hardly remember his saying anything, the response was, therefore, more eloquent for it came in silence, from a heart too full for utterance.

RACINE, WIS., December 27, 1869.

TO R. W. EVANS, J. C. RICHARDS, KATE RINEHART, E. W. DUTCHER, and others.

I was so suprised, on Christmas morning, at being made the recipient of a beautiful watch, a gift from my associates, that I could not with any degree of satisfaction express my thanks for this evidence of your kindly remembrance and esteem. I therefore wish to write and tell each one of you that I accept this token of your friendship with mingled feelings of pleasure and regret ; of pleasure, for it is an honest vanity that welcomes encouragement, when every thought and nerve are strained to the prompt discharge of duty ; of regret that I am so unworthy this valuable remembrancer at the hands of my colaborers.

Believe me, I shall treasure this free-will offering, this beautiful gift, and while it performs its part with every throb of its busy life will come the echo of many names that ne'er will be forgotten.

I shall continue, with renewed efforts in the discharge of every duty, cheered by the memory of your favor and the kind words accompanying it. Indeed, I thank you for this testimonial, with the assurance that I shall ever strive to merit your approval, and I am sure if we each strive to "act well our part" there will never be any necessity for "Watching" one another, except on "tick."

"Wishing you all a happy New Year, I am, dear friends,

Gratefully and truly yours,

E. O. WAIT.

Fraud.

"A bill was filed in the Chicago Circuit Court, relating to telegraphic interests. The bill is Jeremiah Terwilliger *vs.* The Great Western Telegraph Company *et al.*

"That on the 11th of May, 1868, complainant subscribed for one hundred shares of the stock of the company, for which he was then to pay $25 per share, or twenty-five per cent. of the par value of each, the subscription being made upon a list with a printed heading, which specified an agreement to pay five per cent. of the sum subscribed, the balance being due upon call of the directors from time to time, provided that when forty per cent. of the par value of each share should be paid in, and the receipts for the percentage surrendered, certificates of stock should issue, as of stock paid up. Of any other conditions than these, complainant says he was ignorant.

"Complainant says that the shareholders had never met to elect directors, or for any other purpose, but that the parties specially named have acted in that behalf, but, perhaps, without authority, as is claimed by an election among themselves, when Mr. Gage was made president, Mr. Snow secretary, and Mr. Reeve treasurer. Subsequently Mr. Reeve resigned, and his associates assigned all the stock of the company to him, it being by the assignment agreed that he (Reeve) should build the line of the company at the rate of $300 per mile, with one wire, and at the rate of $100 per mile for each additional wire, with liberty in him to sell the stock, and from the proceeds pay himself for the expense of his labor, and reimburse himself for his outlay.

"Under this agreement the stock was transferred, Reeve giving no security that he would fulfil his contract, he being (it is stated) wholly irresponsible, whereupon he went to Canada, commenced the erection of telegraph wires, being there until the 1st instant.

"It is charged that the contract was made for the purpose of bringing the capital stock into the hands of the defendants named, that they might thus defraud the stockholders, and that the company was organized as a fraud upon the public.

"In aid of the proposed fraud, it is averred that, after subscriptions were made, the heading or conditions thereof were altered.

"There is an allegation that 40 per cent. of the capital stock ($3,000,000) would be sufficient to establish the lines of the company, and that it was and is only the intention to call in from thirty to thirty-five cents on the dollar subscribed, and then to refuse to issue any certificate until the sum of 40 per cent., covenanted for, should be paid up, wherefore, as it was not wanted, the company would not be bound to issue. It is also suggested that *Gage now, and Reeve, claim that there is no right to pay the 40 per cent.* until it is called for by the directors, wherefore, if there be no such call, there cannot be an issue of stock. By reason of which subscribers will be defrauded.

"It is charged that from assessments already made, about a quarter of a million dollars have been received, the same being paid over to Snow as the agent of Reeve, and as the builder of a portion of the line of the company.

"It is further alleged that the contract is illegal; that the actual cost of building the first line is only $70, instead of $300; and only $32, instead of $100, for each additional wire.

"There is a further averment that the directors have met only once, and then at the instance of subscribers Charles H. Beckwith and C. B. Farwell, who had become dissatisfied with the conduct of affairs. *They demanded an investigation, and to avoid trouble, these received in some way the transfer to each of* 100 *shares of stock without consideration other than their silence.*

"It is charged that the so-called directors have never paid anything on their stock, and that, although the company was formed in December, 1867, there has never been a report of its business transactions, but to the contrary, there has been a total concealment of its condition, although there have been highly colored handbills circulated, in which it was stated that these were directors: Elisha S. Wadsworth, Nathan Mears, C. B. Farwell, J. C. Haines, Samuel Hall, J. Lombard, B. F. Culver, F. B. Gardner, David Krigh, N. K. Fairbank, George W. Gray, and A. F. Dwight, who are stated never to have been elected, the averment being that, because of their standing and wealth, *their names have been used to inspire a false confidence on the part of unsuspecting capitalists in the company.* These, or other handbills, it is alleged, gave a list of a number of points to and from which lines ran, and this, it is said, when, in point of fact, the line is only erected from Chicago to Milwaukee and Rock Island. In the business of which, however, it is alleged a profit of 18 per cent. was made, if a circular issued is to be believed.

"Complainant says that he paid $600 on his stock, whereupon he demanded a certificate, which was refused to be given to him. Thereupon he offered to pay up the full 40 per cent., which was refused to be received, except as the directors should call for it.

"The prayer is for a full disclosure as to the condition of the company as well as that the contract with Reeve may be declared fraudulent and void: that the directors may account, and that certificates may be compelled to be issued to him."

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The "Word" as a Circumnavigator of the Earth.

At the present moment, the Great Eastern is at work, to bring about a submarine telegraphic connection between Suez and Bombay, for which purpose a cable four thousand miles in length is required. This line, joined to the Malta Alexandria cable, which has for a long time been in operation, brings the East Indies in direct telegraphic connection with England, with New York, with San Francisco. And more than that, already is it announced from London, that the continuation of the East India cable over further India, as far as Hong Kong, is determined upon. The needed company has already been formed in the British Capital, and there is no doubt, that with the ease with which ocean cables are manufactured, as well as laid, not too long a time will elapse, ere London will receive direct telegrams from Hong Kong; ere New York will agree on tea prices with Chinese exporters, by way of Europe, in the course of a few hours, or ere Koopmanshaap will send his coolie orders from San Francisco, by the same route, and will be enabled to send lightning to his "celestial" agents at the same time.

Enough of this, however. After the Atlantic and Indian Oceans have been made carriers of the electric winged word, the proud Pacific cannot escape the same fate. That the Great Eastern will also, in not too distant years, divide with an Asiatic American Cable, who will doubt it in the face of what ocean telegraphs has done. True, the necessity for such a cable, is not pressing at the moment, but even in the next hour it may be felt, and may be demanded, and then its realization will be only the work of a span of time. Until then, one will have to be content with an advance act in the drama. This advance act consists in the cable connection of its Siberian coast, with Japan and China, lately concluded upon by the Russian Government, which, reaching China at Shanghai, would, by means of a telegraphic network, which is to connect all the principal cities of the empire (to be built by an American company for China), also be brought into connection via Hong Kong with Bombay. This Russian Chinese cable is intended to connect St. Petersburg with China, by means of the great Russian-Siberian Overland Telegraph, now driving towards completion, and it would be by no means a difficult task to establish a connection between the Pacific Telegraph System of the United States, whose extension to Alaska is even now the subject of debate, and the Siberian Telegraph carried as far as Bherrings Straits, which would close the last link in the then world surrounding telegraphic chain.

Ours is the time of wonders, and in fact not a year passes but some triumphs of human undertakings are recorded in the books of history, of which fancy could not dream a half or a quarter of a century ago. And had it been possible for her, how doubly surprised would she now be, to find completed that which she thought of in a poetic hour, and to find it rendering the most serviceable and most prosaic service in every day trade and affairs. But as it happens to all wonders, one becomes accustomed to them, or, as it is so often the case in our rapidly advancing time, one is startled at the projects, anticipating their completion as a matter of course, and reaping the fruits of their completion, similar to a farmer carrying home the crop of a never doubtful season. But even therein is contained a proof of the greatness of these times, that in them projection and realization is one, and so we can anticipate the day, and regard as secured the advantages of the great commercial intercourse between the different parts of the world, as the first word consigned to the care of this telegraph wire, takes its conquering way unchecked around the whole of earth.

W. P.

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Proposed China Submarine Telegraph.

[From the London Post.]

The prospectus was issued Dec. 10, of the China Submarine Telegraph Company, in connection with the Falmouth, Gibraltar and Malta, the Anglo-Mediterranean, the British Indian Submarine, and British Indian Extension Telegraph Companies, thus forming a fifth link in the line, and extending to the empire of China the great system of submarine electric telegraphs between England and the East. Traffic arrangements have been entered into with the four companies above named, all of which are represented on the board, by which they have agreed to give an ample rebate upon their through rate on all messages forwarded over their cables from or to China.

The first section of the new line of telegraph will consist of a cable about 1,640 miles in length, to be laid from a station of the British Indian Extension Telegraph Company in the Straits of Malacca to Hong Kong. It is proposed to establish an intermediate station at Saigon, Cochin China, upon satisfactory arrangements being concluded with the French Government. The second section, about 1,000 miles in length, is intended to be laid from Hong Kong to Shanghae, touching at one or more of the other treaty ports; and hereafter the company have it in view to extend their lines to Japan. The capital is fixed at £520,000, in 52,000 shares of £10 each, of which £100,000 will be taken in fully paid up shares by the Telegraph Construction and Maintenance Company, which has contracted to manufacture and lay the cable from the Straits of Malacca to Hong Kong for the sum of £503,000, the £100,000 in shares being retained in the hands of the new telegraph company until the line has been opened and successfully worked. The Telegraph Construction Company have contracted that the cable shall be shipped from England next year and completely laid by June, 1871. It has also been arranged with the Construction Company that the second section of the company's cables shall be made and laid for £250,000, and be commenced when required.

The prospectus states that it appears from recent published statistics that the English and foreign firms in Hong Kong and the treaty ports number 483. The Chinese firms dealing with foreigners in Hong Kong alone are 486. The foreign ships cleared and entered at Chinese ports in 1868 numbered 14,075, with an average tonnage of 6,418,503 tons. The total value of the imports and exports for Hong Kong and the treaty ports in 1868 amounted, according to the custom returns, to £68,000,000. From these statistics, which are exclusive of the very important local trade, it cannot be doubted that there will be as well in through messages to Europe and America, as in messages between China and India, the Straits and the Eastern Archipelago, a very extensive telegraphic business.

The cable is to be of a similar type with that of the British Indian Extension Telegraph Company, but will be considerably heavier on account of the lesser depth of water in which it will have to be submerged.

ENGLISH UTILIZATION OF THE NETWORK.

Captain R. B. Oldfield, of the Royal Navy, an experienced officer, has (December 10) been granted leave by the British Admiralty, and has proceeded, on behalf of the Telegraph Construction and Maintenance Company, to Siam and the Malay Peninsula, for the purpose of exploring certain routes by which that company proposes to establish a telegraph communication from Burmah, the Tenasserim Provinces and Siam with Penang, so as to throw the traffic upon the British Indian Extension Company's cable, which will be laid in the year 1870 between the Straits of Malacca and Ceylon.

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The Electric Piano.

The idea of playing on a piano through the agency of electro-magnets is comparatively new. In the patent record of the small kingdom of Wurtemberg we find that, in 1860, a patent for an electric piano was granted to a certain Mr. Andrea, in Sindelfingen. It appears, however, that this invention, though patented, met the fate of so many others—it would not work; consequently the *soi-distant* inventor, in order to carry the original idea into success, found it best to address himself to Mr. Hipp, an acknowledged authority in telegraphy, and the proprietor of an establishment for manufacturing telegraphic apparatus in Neuenburg, Switzerland.

"The first idea that presents itself in reflecting upon the construction of an electric piano," says Mr. Hipp, in a paper recently published upon the subject, "is, generally, to place the electro-magnets beneath the keys; but such an arrangement is utterly impracticable, as it gives rise to a rattling noise, loss of power, and an increasing loudness of the tone, while the tone should begin loud and gradually decrease in power. The first, therefore, consisted in the invention of an electro-magnet that would have the inverse property of the common one, namely, that would begin its motion with the maximum of force and end with a minimum of it."

Such a magnet has been constructed by Mr. Hipp, and it is undoubtedly to this that the final success of the electric piano is due. The electro-magnets are connected with the hammerwork by means of light wooden rods. The keys, therefore, remain immovable during the playing. It is not essential that the piano should be of a peculiar construction, as the necessary alterations can be made in any ordinary piano. The pitch obtained by such an electro-magnet is similar to that of the fingers; indeed, it cannot be distinguished from it. The force of the pitch evidently depends upon that of the electric current, and may be made to vary with the latter; indeed, such a piano may be made to play so that the tone produced by it can no longer be distinguished by the ear. All that remains is to reproduce the various tones according to their intensity and succession as they correspond to a composition. This is accomplished by a particular machine, the play-machine, which is quite simple. It is founded upon the Wheatstone telegraph, and is quite similar to it. Upon a metallic support, or roller, there are as many springs as the piano has keys. Between the roller and the springs there runs a wide paper strip, which is perforated lengthwise for the pitch and the duration, and along the width for high and low tones. In addition to this, a part of the strip is destined for regulating the intensity of the current, as regards the tone. Each of the springs is connected with the electro-magnet by means of a wire. If now the paper strip is set in motion, the galvanic current is closed by the springs as often as they meet a perforation, and the tone is at the same moment produced. The duration of the tone depends naturally upon the length of the perforation, and the tempo upon the speed with which the strip is moved.

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Flashes of Lightning.

There is something very mysterious in these attacks of lightning on the human body. We know in a sort of rough, general way that metals and other substances differ greatly in their power of conducting electricity; but science must advance beyond its present stage before we can lay down infallible rules for guidance. Some persons have supposed that lightning does not penetrate far beneath the surface of the ground; but in 1843 three men were struck with a flash at the bottom of a mine six hundred feet deep—the lightning having passed down a chain in the shaft. Others, again, believe that safety is to be found in bed. It certainly is so generally, but by no means universally. In 1828, lightning attacked a cottage near Chichester, destroyed with a crash the wooden part of a bedstead, threw the bed clothes on the ground, and with it the mattress and a person who was sleeping on it—fortunately without further mischief. Again, in the same year, near Doncaster, a flash of lightning tore the coverlet from a bed, but without doing any injury to its occupant. Again, in 1772, Mr. Hearthley, of Harrowgate, was killed by lightning while asleep in his bed; his wife, lying by his side, was not even awakened by the shock. A Roman Catholic church was once struck by lightning during the celebration of mass; two of the three officiating priests were struck dead, while the third remained untouched. Sometimes trees are sought, sometimes shunned, for shelter during thunder storms, according to the prevalence of certain opinions. Some years ago, a theory was broached to the effect that lightning often strikes the elm, chestnut, oak, pine, and sometimes the ash, but not the beech, birch, or maple; then there was an assertion that, when the oak and the pine grow near together, the latter escapes while the former is attacked. Generally speaking, however, the opinion prevails pretty strongly, that the further distant we are from trees during a thunder storm the better. The supposed protective power of glass, too, is not always reliable. In 1780, two persons were killed at Eastbourne while standing inside a window during a thunder storm; the glass was reduced to powder, but the woodwork of the window remained uninjured. Any articles of metal worn about the person are pretty certain to increase the danger from lightning. In 1819, lightning attacked the prison at Biberach, and out of twenty prisoners in one apartment, attacked only a brigand who was chained round the waist, leaving the others unscathed. In 1749, during a thunder storm, a lady raised her arm to shut a window; the lightning flashed, and "a golden bracelet so completely disappeared that not a vestige of it could be found," without the lady herself being hurt. The *complete* disappearance of the bracelet is probably a bit of exaggeration. The melting, without the actual disappearance, is credible; for in 1844, a lightning flash struck a fishing boat off the Shetland Islands, shivered the mast, and melted the watch in the pocket of a man sitting near the mast, without scorching his clothes or injuring him. In 1858, when a peasant woman was killed by lightning near Auxerre, in France, not a wound was found on her body, but a silver comb was melted in her hair—probably defining the spot where the death-stroke was given. Brydone relates an incident of a lady whose bonnet was reduced to ashes while she was looking out of a window at a thunder storm; it is supposed that the wire in the bonnet attracted the electricity. It is not, however, very likely that ladies will adopt the highly scientific precaution suggested by him for such occasions: "Every lady should wear a small chain or thread of brass wire, which she should hang, during the time of a thunder storm, to the wires of her bonnet, by which the fulminating matter might pass to the earth, instead of traversing the head and other members."

Not the least embarrassing of the questions which arise in reference to lightning flashes is to guess in what way the action will show itself when two or more persons are near each other in a line or in a curve. Will it act most at the extremities of the line, or in the middle? In 1808, a lightning flash struck a house in a Swiss village; five children were sitting on a bench; it killed the first and last in the row, but gave only a violent shock to the others. In 1858, at Drome, in France, a lightning flash killed a young girl in a farm house, but left untouched a child in her arms. It is not yet known whether horses and other quadrupeds resist the effects of lightning less safely or more safely than human beings; for some recorded facts tell on the one side, some on the other. In 1785, lightning attacked a stable at Rambouillet: thirty-two horses were in a row; thirty were overturned, of which two at the extreme ends of the line were killed. In 1801, a miller near Chartres was walking between a horse and a mule; the two animals were struck dead by lightning, while the man escaped with slight injury. In 1781, three French gentlemen were out riding: a lightning flash killed all three of the horses, but only one of the riders. In 1826, a boy was leading a mare on a road near Worcester: a thunder storm came on, which killed the mare, but left the boy unhurt. In 1810, a gentleman was sitting with his dog by his side: a lightning flash killed the dog, but only gave a slight shock to the gentleman. In 1858, while a clergyman near Leatherhead was riding in a fly with two members of his family, a lightning flash struck the driver from his seat, without hurting the other persons or the horses. There is almost as much doubt whether the popular view is correct, that water is less attacked by lightning than land. Kaempfer stated that the emperors of Japan were wont to take refuge in a grotto containing a reservoir of water during a thunder storm. Do the Tycoon and the Micado, of whom we hear so much now-a-days, practise the same cunning device? That fish are stunned in the water there is sufficient proof. In 1772, lightning attacked the River Doubs, near Besancon, and stunned the fish, which were floated along by the stream. In 1670, a lightning flash fell on the lake of Zirknitz, in Austria; and "such a quantity of fish almost immediately floated upon the surface, that the neighboring inhabitants collected twenty-eight wagon loads for manure."

In Congress.

Mr. Fitch, (Rep., Nev.)—To abolish the Franking Privilege from the 1st July, 1870, and authorizing the Postmaster General to contract for the construction of telegraph lines over the principal mail routes, and to establish a Postal Telegraph system in connection with the Post Office Department, the construction account not to exceed in any year $3,000,000.

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The United States Postal Telegraph Company.

Mr. Ramsey, of Minn., has introduced a bill to establish a postal telegraph system and to incorporate the United States Postal Telegraph Company. It authorizes the Postmaster General to establish telegraph offices in connection with the post offices in every city and village where telegraph stations are now maintained, and at such other places on the line of the telegraph as the business of the company may require; to provide for the reception of messages at every postal telegraph office, sub-office, and street letterbox, for their transmission between postal telegraph offices, by contract with the Postal Telegraph Company, and for their special and immediate delivery where a letter delivery is provided by law, or within one mile of every postal telegraph office, where there is no delivery; and a delivery at special rates, beyond such limits, excepting messages transmitted at night, which shall be delivered the next morning. He is also directed to provide for the transmission of messages by mail to or from the nearest postal telegraph office, when received for or destined to any place not having such an office; for the transmission by telegraph of postal money orders; for the transmission of the message in special cases; for printing of transmissions and for transmissions where the whole amount has not been paid. The rates to be prepaid for transmission and delivery of messages of twenty words or figures, or less, including date, address and signature, shall not exceed twenty-five cents for each and every 500 miles, or fractional part thereof, measured in an air line, and for each additional five words or figures, or less, one-fifth of the above rates. But the rates for messages directed to be transmitted by night shall not exceed twenty-five cents for each and every 1,000 miles or fractional part thereof, and for each additional ten words one-fifth these rates. The rates shall be prepaid by telegraphic stamps and shall cover the expense of the post office of immediate special delivery and of transmission by mail where required to or from any postal telegraph office in the United States. The bill authorizes a contract to be made with the Postal Telegraph Company for ten years, upon their furnishing security for the performance of these requirements. The Postal Company is authorized to make special contracts for the transmission of press messages, the rates not to exceed five mills per word by night and seven and a half mills by day for every 500 miles. Where the same message is delivered at the same office to several newspapers but one rate shall be charged, with the necessary cost of manifold copies when made by the company; and the rates for the Associated Press news shall not exceed those now paid by the several press associations to the Western Union Telegraph Company. A postage of two cents shall be paid on each press message; but where copies of the same message are dropped off at several offices but one postage shall be paid. The Postmaster General shall, from time to time, reduce the compensation to be paid to the company and the rates to be paid by the public for the transmission of messages; provided the net income of the company (after the payment of its operating expenses) shall not thereby be reduced below ten per centum per year on the capital stock of the company. Telegraph stamps are to be provided, &c. A commissioner of telegraph is to be appointed and punishment provided for divulging the contents of messages or wilful obstruction of their transmission. The eighth section incorporates Gardiner G. Hubbard, S. W. Bates, and Estes Howe, of Massachusetts; Woodbury Davis, of Maine; A. P. Miller, of Ohio; John F. Tracy and E. D. L. Sweet, of Illinois; R. Blakely, of Minnesota; B. F. Allen, of Iowa; W. F. Downs, of Kansas; Chas. G. Hammond, of Nebraska; L. J. Barnes and G. R. Weeks, of Arkansas; S. A. Stockdale and J. J. Noble, of Louisiana; Charles J. Pollard, of Alabama, and John P. King, of Georgia, and Peter Parker and Anthony Pollok, of Washington, as a body politic under the name of the United States Telegraph Company. Finally, it is provided that at any time after five years from its organization the Postmaster General may purchase the property and franchises of the company on terms to be fixed by five disinterested persons, two to be chosen by the Postmaster General, two by the company, and the fifth by those four; provided that the terms shall be approved and the purchase consummated by Congress.

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In the Senate.

Mr. Sumner (Rep., Mass.), from the Committee on Foreign Relations, reported a substitute for the bill relating to telegraphic communication between the United States and foreign countries.

The substitute provides that all such communication by means of lines or cables partly within the jurisdiction of the United States shall be subject to the following conditions:

First.—The Government of the United States shall enjoy the same or similar privileges regarding the use and control of said lines as any other Government.

Second.—The United States to be entitled to use the lines one hour in every 12 for the transmission of Government messages by its own operator. Such messages from this country to take precedence over all others.

Third.—The general regulations and rates for the transmission of such messages to be established by the Postmaster General, if not otherwise fixed by agreement.

Fourth.—The lines shall be kept open to the public for the transmission of commercial intelligence for daily publication, and all messages to be forwarded in the order of reception, except as above provided.

Fifth.—It shall not be lawful for two or more companies to consolidate or unite their interests without the consent of the Postmaster-General of the United States, and upon such terms as he may determine. If any two or more such companies have combined, or shall combine, to fix the rates of compensation for messages, it shall be the duty of the Postmaster-General in the absence of an international convention regulating the matter, to determine such rates, and to establish such rules and regulations with regard to them, as he may judge necessary, and the exercise of these powers shall be subject to the control of Congress, and be applicable to existing cables, as well as those hereafter established.

Sixth.—The written acceptance of the foregoing conditions must be filed with the Secretary of State before extending any such line within the jurisdiction of the United States.

The second section gives the consent of Congress to the laying and maintaining of telegraph cables from foreign countries to the United States, subject to the foregoing stipulations, to the terms of such grants as have heretofore been made by Congress for these purposes, and to any and all rights of property and State jurisdiction in and over the same, provided that the privileges hereby conferred shall not be enjoyed by any company or persons whose line or cable extends to any foreign country where similar privileges are not conferred upon companies incorporated by the United States or by any State of this Union; but this provision shall not be applicable to any already existing or authorized line or cable, except that recently landed on the coast of Massachusetts.

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To relieve from the terrible effects of running a nail in the foot of man or horse, take peach leaves, bruise them, apply to the wound, confine with a bandage. They cure as if by magic. Renew the application twice a day, if necessary, but one application usually does the work.

Preservation of Poles.

There are two general classes of substances which have been resorted to for the preservation of wood fibre from decay. The one embraces all varieties of mineral salts, such as sulphate of copper, corrosive sublimate, chloride of zinc, carbonate of soda, pyrolignite of iron, &c.; the other bituminous substances, such as asphaltum, resin, wood tar, and coal tar and its products. Chief among those, and every way most valuable, is the dead oil, or "creosote oil" so called, which is one of the products of the dry distillation of coal tar. The active principle to which scientific men attribute the preservative and antiseptic action of the oil on lignin is carbolic acid, the remarkable efficacy of which in industrial, therapeutic and disinfectant matters is barely yet well appreciated. So far as its efficacy as a preservative of wood fibre is concerned, that is placed beyond doubt by the experiments of various European Governments, who have within the past five years published official reports which fairly bristle with the facts and figures. The creosote oil is shown to not only prevent wood from decay, but to protect it from the attacks of every variety of insect and worm on land and in the water. Not the least important consideration, moreover, is the fact that the treatment with this substance is much cheaper than by any of the mineral salts commonly used, and there seems but little excuse for the officers of telegraph companies to neglect the adoption of so simple and satisfactory a method of protecting the interests of their stockholders. The best plan known abroad for applying the carbolic acid, or creosote oil, to the pole, is that of John Bethell, consisting of an injection of the liquid by strong atmospheric pressure in a closed cylinder; but this appears from the official reports to be quite unsatisfactory, as the oil cannot be made to permeate the whole woody structure evenly throughout. The Chief Engineer of the French Government accounts for this by the fact that the air within the pores of the wood is so compressed from each end that it finally acts as a spring, and resists the penetration of the oil to the heart. The American inventor overcomes this difficulty by vaporising his oil, and allowing it to find its own way by natural expansion into the wood, as the natural moisture in the cells becomes converted by heat into steam. Microscopic examinations made by some of our eminent scientific men reveal the presence of oily globules in the inner pores of wood which have been subjected to creosote vapors, and their character has been decided by the chemical tests of Professor Jackson and other, who pronounce them carbolic acid. We understand, moreover, that the engineers and chemists of the telegraph companies themselves have also been investigating the subject and have reached the same conclusion, viz: That the dead oil will preserve wood fibre; that it can be made to penetrate the entire structure of the wood; and that the vapor process is the best hitherto discovered for accomplishing this at a moderate cost.

Upon the question of the durability of telegraph poles some light is thrown by an accident which occurred in Vesey street a few days since. A runaway team dashed their wagon against a large red cedar pole, which was erected in 1861 by the American Telegraph Company, and broke it off short at the surface of the ground. The inside was found to be completely decayed, while the outside presented a fair and sound appearance. W. F.

◆

Dr. Bernsie, of Paris, bleaches the ruddy noses of topers by means of electricity. He has recently restored a lady of the highest rank to happiness, changing her nose, a blooming rose, into a delicate lily, and this case is causing great sensation in the scientific world.

SONOGRAPHY.

Taking Instantaneous Pictures of Sound.

[From the Detroit Post.]

Some ingenious writer asserts that the time is not far distant when a man's words will be made to write themselves down automatically, as fast as they come from his lips, and supports his bold proposition in this wise:

"Light is a wave motion, and the chemist has found a substance, which the waves, as they dash against it, can transmute, and so we have photography. Sound is a wave motion, its waves are as breakers, lights are as ripples—the former large and slow, the latter small and rapid. Now, since we have the substance that is impressible by the little, weak waves, why should we despair of finding a substance that will alter under the influence of the great, strong ones?"

There is a good deal of plausibility in this. Have you ever been thunderstruck, gentle reader, or had your ear split and nervous system prostrated by a caterwaul? If you have, you will not long "despair of finding a substance that will alter under the influence of sound." The difficulty is in finding a substance upon which the different sounds will permanently impress or sonograph themselves in different colors, so that they can be distinguished and interpreted afterward; somewhat as the different rays of light photograph themselves in the camera. The analogy between sound and light, upon which the writer builds his theory, extends to their motion but not to their chemical properties, and as it is with the latter that photographers and sonographers have to deal, his inference is hardly warrantable.

If human ingenuity ever hits upon a device for taking instantaneous pictures of sound, we may expect some curious results. Instead of verbal descriptions, which flattery and malice too often make untrustworthy, we shall have operatic pictures in which the quality of every tone will be indicated as accurately as though it had been measured with a tape-line. Reporters will then go provided with a camera, which, placed before a speaker, will quietly sonograph all he has to say; but suppose a sorosis club were brought into the focus for a few minutes, who would undertake to decipher the manuscript then? Trebles and altos, C sharps and B flats, opinions on politics and poodles, confidential whispers and the rustle of dry goods, all faithfully recorded on the same little sheet of plate, and all to be obliterated before it left the hall, let us hope, by a sudden clap of thunder. Spare us the sonograph, Mr. Philosopher. If you please.

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Extracting Bullets from Wounds by the Aid of Electricity—An Important Invention.

A writer in the last number of the *Gentleman's Magazine* says: "Curing should be as important as killing in the arts of war; extracting your enemy's bullets from your own flesh is the next duty after putting your bullets into his flesh. Now, bullet-probing is a tiresome and painful operation, one that ought to be reduced to the perfection of simple certainty. So humane philosophers have thought; and they have done their best to give their thinkings tangibility. But we are bounded by our means; and while there were men known whereby a lump of buried lead could be told from a fragment of shattered bone, probing was slow work. However, the next time—far be it—that wholesale bullet extraction has to be performed, it is to be expected that the army surgeon's labors will be lightened by the help that electricity will afford; for two inventors have independently proposed methods of searching for and drawing out metallic missiles from the wounds they have inflicted. Both men told their ideas to the French Institute at one and the same meeting during the past month. M. Trouve was one; he who made the electrical jewels that delighted fashionable Paris for a few months two years ago. His new bullet probe is a double-pointed needle, each point being connected by a wire with a little electrical battery and a bell, which rings whenever the two needle points are united electrically; that is to say, whenever they both touch a piece of metal. With this divining rod, bullet searching is a simple business. The suspected part of the body is probed with it, and the instant the points touch the lead, the bell announces the fact. The bullet found, the worst half of the extractor's task is over. This plan was suggested by an Englishman, I fancy, some two years ago, but not put to trial till M. Trouve made an instrument. The other proposition is of more limited application. M. Melsens is the author, and he promises to draw fragments of iron and steel from a flesh wound by the help of powerful magnets. He can do nothing with lead, though, because it does not follow the load stone. Trouve's is the best idea. There is quaintness in the notion of a bullet telegraphing its whereabouts."

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A Battery Boy Gives Light.

Editor Journal of the Telegraph:

Having noticed your correspondent's inquiry in reference to "Earth Crosses," I will give him the benefit (?) of my understanding of the subject. The reason that currents through the earth do not cross and interfere with the working of lines is simply because when the circuit on any wire is broken, the batteries on that line can find no other channel through which to complete their circuits, there being no course except the original one. When air lines cross it affords two or more channels for the batteries to complete their circuits; for example, if one circuit were opened on the east side of a cross, the western battery could form its circuit by passing through the cross and to the earth over another wire. Using one wire for the return circuit of several "locals," is a similar principle. Instead of using the earth for the return circuit of two or more wires, we might use a third wire, which would answer the same purpose as the earth, although the two circuits would be connected. No cross would appear for the reason stated before—that, were the circuit opened on any wire at any place between the points where the circuits intersect each other, the batteries on that line could find no other channel to complete their circuit, and consequently there would no current pass over any part of the line.

Battery Boy.

Buckeye State, December 28, 1869.

◆

B. F. Woodward, for a long time local agent of the Western Union Telegraph Company in Denver, has recently received the appointment of Assistant Superintendent of the Company, having charge of all the lines south of Cheyenne, in the Third District. This covers the Denver and Santa Fe line, which has been purchased by the Western Union. Mr. Woodward has devoted the best years of his life to the operation, construction and management of telegraph lines. He opened the first office, and, we believe, sent the first message ever dispatched in Colorado, and since that time has assisted in the extension of wires to Central and Georgetown, from Denver to Santa Fe and for the U. S. & M. Company, a distinct line to Cheyenne. He now fills the responsible position of controller of all the telegraph lines in the District, and one which he is fully competent to fill with credit.—*Colorado Register.*

Gratifying Testimony to a Skillful Man.

Boston, January 3, 1870.

Madison Buell, Esq.

Dear Sir.—I have watched daily the development of the electrical portion of the work in connection with the re-modelling of the Boston Office, coming under your immediate direction.

And now that it has been completed, and your efforts have resulted in such perfect success, I wish to assure you that in my judgment, this office can have no superior, so far as it relates to the electrical department. The improvements which have been made, over the old system, simplifies the work, and produces economy in labor and materials.

To your skill, therefore, are we indebted for these present improvements, creditable alike to you and the company.

Yours, very truly,
Chas. F. Wood, Superintendent.

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Working on Open Circuits.

We print the following with pleasure. It was crowded out, with columns of other matter, from our last number. As we have no description of the plan adopted, we cannot state in what it differs from Mr. Frey's, than which we can conceive of nothing simpler The reversal of two screws and the two key anvils is all it requires, the sound and action remaining the same in every respect:

Lima, Peru, December 22, 1869.

Editor Journal of the Telegraph:

Sir.—In reference to the remarks with which you were good enough to preface my letter of the 27th September last, (Journal November 15), relating to the self-closing system, introduced by me, in Peru, and for the past four months in daily use, on above one thousand miles of line; kindly permit me to state in your excellent paper:

1st. That my arrangement is entirely different from that of Mr. Frey, and *especially* in the key and connections.

2d. That the reading by sound is precisely similar to the present system.

3d. That for a few cents, and in a very short space of time, any of the instruments now in use in the States, can be altered to this self-closing system, as has been done with all the American instruments in Peru,—and

4th. That the operators in working it, are sensible of no change, but the welcome and advantageous absence of the "switch" or "circuit closer."

From your accustomed kindness, I feel assured you will do me the favor of publishing this in next issue.

Remaining, Yours Obediently,
John M. MacLachlan,
Engineer, C. N. T.

◆

Washington, Jan. 18, 1870.

It is remarkable that the strike should have occasioned so little interruption to business. The press of this city have received their full telegraphic reports regularly, and we have yet to hear of a paper in the United States whose telegraphic columns have shown any diminution in its usual contents, save at Rutland, Vt., and in that instance the interruption was only for a single day, and was occasioned by the assignment of an incompetent operator. To Mr. S. R. Gifford, of Syracuse, the Superintendent of this District, the Company and its officials at New York are indebted for valuable and indispensable services. To a large number of the operators in Mr. Gifford's District, also, the Company is indebted for valuable assistance in helping them out of their temporary embarrassment.—*Lockport Courier.*

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 6,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

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Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, FEBRUARY 1, 1870.

End of the Telegraph Strike.

ORDER OF THE GRAND CHIEF OPERATOR ABSOLVING THE OPERATORS FROM THEIR OATHS.

New York, Jan. 18, 1870.

To all Circuits:

I have canvassed the situation, and believe it is useless to longer continue the strike. I hereby absolve all Western Union members from their oaths, and advise them to return to work.

R. W. Pope,
Grand Chief Operator Telegraphers' Protective League.

This pronunciamento is eminently sad and notable. It is very grand, very gloomy, and very peculiar. It is like Napoleon standing amid the evening shadows of St. Helena, with knit brows and heavy heart, acknowledging defeat, and dismissing the old guard from service.. A few days ago it was not so. Mr. Pope then stood a crowned king. Like King John, he was in the mood to say with that royal gentleman,

> "If thou but frown on me, or stir thy foot,
> Or teach thy hasty spleen to do me shame,
> I'll strike thee dead."

Now he absolves his retainers from oaths as royally as if he were the God before whom they were taken. He advises men and women to return to work whose places have been necessarily filled by others. He charges the Company, in a recent mournful valedictory, with "sacrificing the legitimate duties of the Telegraph in order to carry out the principle that labor has no rights which capital is bound to respect," when he knows that the Company has simply refused to allow him to take its presidential chair. He charges it with "taking undue advantage of intelligent men," and yet curses the treachery of the man who foiled his own plans to render the Company helpless! But we have had enough of this. The lesson has been good and severe, but we have learned it. We have only to say, in the words of the Buffalo *Courier*:

"It appears to us that this 'Grand Chief Operator' Pope, who so magniloquently administers the rite of absolution to his subjects, would be better entitled to their respect if he had 'canvassed the situation' before the strike which he decreed, instead of after."

◆

Hon. William Orton left Southampton for New York on the steamer *Rhein*, Tuesday, January 25th.

The Salaries of Telegraphists in Europe.

The following official statements of the salaries paid to the officers and employes of the telegraph service in several European countries are taken from the *Annales Telegraphiques* and the *Feuille Officielle de L'Administration des Telegraphes*. It will be observed that the rate of compensation, even on a gold basis, is less than one half the amount received for similar services in this country.

FRANCE.

General Superintendents	$2,400	per	annum.
Division " 1st class	2,000	"	"
" " 2d "	1,800	"	"
Managers of Offices, 1st class	560	"	"
" " " 2d "	520	"	"
Principal Clerks	500	"	"
Operators, 1st class	480	"	"
" 2d "	420	"	"
" 3d "	360	"	"
" 4th "	320	"	"
" 5th "	280	"	"

SWITZERLAND.

Superintendent	$900 00	per	annum.
1st Secretary	600 00	"	"
2nd "	500 00	"	"
Auditor	600 00	"	"
1st Assistant Auditor	480 00	"	"
2d " "	360 00	"	"
4 Inspectors	$540 00 to 720 00	"	"
Managers of Offices	360 00 to 600 00	"	"
Operators, 1st class	480 00	"	"
" 2d "	420 00	"	"
" 3d "	360 00	"	"
" 4th "	320 00	"	"

PORTUGAL.

Director General	$1,500 00	per	annum.
Inspector	1,100 00	"	"
Superintendents	600 00	"	"
Office Managers, 1st class	450 00	"	"
" " 2d "	300 00	"	"
Operators, 1st class	300 00	"	"
" 2d "	240 00	"	"
" 3d "	200 00	"	"
" 4th "	150 00	"	"
" 5th "	125 00	"	"
Line Repairers, 1st class	100 00	"	"
" " 2d "	80 00	"	"

ITALY.

Chief Inspector	$1,200 00	per	annum.
Sub-Inspector	800 00	"	"
Directors of 1st class	1,100 00	"	"
" 2d "	900 00	"	"
Chiefs of Section of 1st class	600 00	"	"
" " 2d "	550 00	"	"
Operators, 1st class	440 00	"	"
" 2d "	400 00	"	"
" 3d "	360 00	"	"
" 4th "	320 00	"	"
" 5th "	240 00	"	"

◆

Mr. E. C. Washburne has succeeded in having his postal telegraph bill referred to a select committee of Congress, and is represented as sanguine of its passage. It proposes to purchase existing lines, make the telegraph a government monopoly, and, of course, open a new field of political preferment. Should the experiment succeed, and government secure telegraphic control, which we do not believe at all probable, we venture the assertion that a lustre of years will not pass away before it is again in private hands.

◆

The bills of Ramsay and others are simple stratagems to secure government help in building private lines. They want free rent of offices, free labor, and ten per cent. profit. We don't see any good which government is to obtain from them, or is proposed. Other schemes, whose authors are tooting their horns in Washington, are simple speculations got up for building margins and other such charitable ends.

The National Telegraph Company.

For several years, at somewhat remote intervals, a Telegraph Company, bearing the above title, has made itself known through the press, but so apologetically and so apparently without purpose, as to avert criticism, and to be forgotten as soon as the modest notice of its existence was read. With the opening of the new year, however, the National Telegraph Co., not only responds to the duties of the season of compliments and calls, but has become so assertive of existence, and so dignified with design, that we must, in ordinary politeness, devote some attention to a visitor bearing so royal a name.

During the past month or more a pamphlet, issued by this company, has been very generally circulated. It is forcibly and ingeniously written, and with great dexterity presents the resources and expectations of its organizers. It claims the possession of a system of telegraphy which must, it avers, revolutionize the business. This claim is accompanied by statements signed by the familiar names of D. H. Craig and George B. Hicks, both of whom bear eulogistic testimony to its excellence and capacity. So deft and cogent, indeed, is the argument of this most respectable looking pamphlet, and so fluent is its style, that on its introduction to Wall Street it produced there an immediate, although very temporary, effect in the depression of the market value of telegraph stocks. To the claims of this pamphlet we propose to give a fair and friendly investigation.

The process proposed to be employed in working the lines of the National Telegraph Co., should these ever be built, is one well known throughout Europe, is in use to some extent in England, and is not unknown in America. It was exhibited to us in 1847 by Alexander Bain, the inventor of what is known as the "Bain system," which consisted in the use of the electric current through a needle point resting on chemically prepared paper, by which a permanent record is produced, and which, with some changes in the chemicals employed, is to be the identical communicating agency of the National Telegraph Company. In the exhibition alluded to, Mr. Bain used a strip of paper, half an inch wide, on which a message of 2,000 words had been previously punched out by an instrument he had devised for that purpose, made it to pass rapidly under a stylus, and which in a few seconds left the record on chemically prepared paper surrounding a large drum near by. To punch out messages on ribbons of paper and pass them over the wires, by a similar process to that described as shown us by Mr. Bain, is the system of the new company. Its only new feature is in the use of a tablet and punching apparatus, the invention of Mr. George Little, of Rutherford Park, N. J., by which the perforating process is claimed to be rendered easier and more exact. It is the Hummiston punching and transmitting process now owned by the Western Union Telegraph Co., accomplished by a different machine, but by an essentially kindred process.

The advantage claimed for this system, however, is not, if we may judge from the pamphlet before us, so much in any ingenuity of its mechanism as that it permits the employment of cheaper and inferior labor. It proposes to supplant the services of skilled men by the employment of young girls at low incomes. It even claims that children may operate the machinery. For a pamphlet devoted to the purpose of winning support to a new scheme, such statements are excusable and expected. A boy has sometimes been left in charge of a mighty engine. Children have been taught to operate the Morse key with ease and celerity, and not a few girls now find occupation in the employ of telegraph companies; but the interests entrusted to the telegraph are too serious to favor a lower standard of service than now employed. To propose it, while the machinery still leaves so much dependent on the care and brain of the operator, seems to us retrogressive and unpromising.

To give a correct idea of the operation of the process of the perforating and automatic system, it is necessary to go somewhat into detail. We must, therefore, follow a message from its reception to its delivery, which we now proceed to do:

1. Its reception requires the usual entries, counting of words, &c., common to all processes.

2. The message is then carried by a messenger to the composing or punching machine, where the operator places it in a suitable holding frame, and proceeds to mark out on the tablet of the machine the words of the message. This tablet we understand to be a series of grooves, in which are set metallic points corresponding to the Morse characters. By drawing a metallic point over any one of these, it is, by the action of magnets, punched out in a paper strip beneath the tablet. We do not desire to depreciate the ingenuity or effectiveness of the device by which this work is done. Mr. Little's name is sufficient guarantee of its merit.

Now, we call attention to a feature of this part of the work of preparing the message, which is likely to be overlooked, but which renders it practically dangerous, laborious and slow. Let it be borne in mind that a young girl is proposed to be employed to do this service, the economy of this species of service being one of the chief claims of the pamphlet. The message having been placed before the operator, she has to look at the written message, fix a word in her mind, and having memorized it, commence tracing it out on her tablet. This done, she again refers to her manuscript, memorizes the next word, and repeats the same process. In doing this the eye, of course, has to pass constantly from the tablet to the manuscript. Now, it not unfrequently happens that a word appears twice in the same message. The operator is apt to forget the locality of the one she has translated by the mental occupation of the translating process, and of course, should the eye return upon the wrong word, the message is mutilated. This changing the sight from one point to another in the ordinary act of copying manuscript, every one knows to be tedious and wearisome, and requires mental steadiness and patience, as at the printing machines. It is much more so where not more than a single word at a time can be safely memorized, still more so is it when the message is without the customary relation of language found in ordinary composition. The Morse operator, on the contrary, never has occasion to take his eye from his manuscript; he has no tablet from which to select his signals, nor machinery to distract him; and the manipulation of the fingers, the movement of which does not exceed a sixteenth of an inch for each part, is performed without the eye resting on or watching it, and almost without thought or fatigue.

Notice also another fact. Were all words employed in a message English and ordinary, the act of memorizing might be easy; but give a young girl, such as the National Telegraph Co. proposes to employ, a cypher message such as the following: "Minglement, cutler, Saxony, Heidelberg, contradict;" and it is easy to see that this memorizing becomes tedious and difficult. Frequent recurrence to the manuscript is found necessary, and this becomes much more so when a message is in a foreign tongue. Remember that there is first memorizing the word to be translated, then the process of spelling out letter by letter the memorized word, at the same time that the mind is selecting the grooves down which the stylus has to be drawn, and you immediately establish a strain upon the mind of a young girl, which is as fatiguing as it is unsafe. This may seem frivolous. Try it. Five girls out of six will spell an unfamiliar word wrong. Remember it is not like writing letters on a black board, where the written letters help out the residue. It requires the constant and utmost concentration of mind. How many young girls are equal to this? It requires a first-class orthographic education. It requires mental health and control. It must be evident to every thoughtful person that such duties can only with safety be entrusted to mature and skilled labor, such as now operate our printing instruments.

3. Under such circumstances, with an ever changing chirography before the perforator, much of it obscure, often ill spelled, and seldom punctuated, we contend that, as on the Continent, so here, a message thus prepared must be examined before delivery to the transmitting machine. This examination requires as much time as the preparation, and must be done by an experienced person. Without this examination the system could not claim the first element of safety, nor could the public be induced to trust it. On the Continent all messages thus prepared are examined before being sent. Here, then, is a second operator necessary simply to *prepare a message for transmission*, each of which processes requires as much time as is needed in the Morse system for sending the message to its destination.

4. The message has now been punched and corrected. A messenger has now to convey it to the transmitting agent. Here the automatic process begins. Let us compare the two systems as to mere labor, aside from the peculiarities of that labor:

The present Morse system has sent the message by the aid of—	The new automatic system has performed the same work by the aid of—
1. A messenger to convey the message to the operating table.	1. A messenger.
2. An operator	2. A translator or puncher.
	3. An examiner.
	4. A messenger to carry message to transmitter.
	5. A transmitting operator.
	6. Service of two machines.

Even admitting that a cheaper class of labor can be employed to perform the various duties of the automatic process, which is not at all evident, the Morse system being in the last degree elementary and easy, there can no economy of labor be shown by the processes necessarily connected with it. We regard the calculations of saving by cheap labor in such a system as thoroughly delusive. This is the testimony of every attempt to give it to public use. The assumption that a girl can be hired at low wages who can do the translating of the automatic process, or supervise its correction, can be answered by a better claim for her ability to perform the simpler work of the Morse system. Under it no such labor as that we have described is at all necessary. It has neither translator nor examiner, and needs neither. More than that, in less time than the average perforation of messages, preparatory to transmission, is performed, the message by the Morse system can be sent to its destination. Such is the testimony of those who have made this subject their study.

Speed.

The question of the speed of transmission by the automatic process after the work of preparation is complete, is not so easily solved. The experiments in rooms cannot be relied on. Distance, resistance, atmosphere, induction, insulation, all claim attention. M. Herr von Frischen, Superintendent of Prussian telegraphs states that, by the type automatic process, 45 messages of 20 words each, can be sent in one hour over a wire 540 miles long. We have heretofore shown that 90 messages of similar length have been sent by the Morse system per hour, and that 45 messages per hour is a minimum or average of ordinary Morse work. In answer to the question of transmission by the punched process, he replies giving the results of experiments in a room with a resistance coil whereby 60 messages were received in an hour by the galvanic current and 120 by the magneto-electric current. Experiments in a room, as we have already said, are comparatively valueless as data for actual performances in the open air where other causes operate in determining rates of speed. The highest of these given, however, has been exceeded by Shape, Hutchinson, Fisher, Stewart, Burns and Bagley by the Morse machine on American lines. Experiments conducted by Prof. Thompson, as shown by Mr. Prescott in our last issue, prove that in a single circuit of 2,000 miles by the ordinary conductors, *ten words per minute* is the maximum of all that is attainable, or one half of the easily performed service of Morse lines for a like distance where repeaters are employed. Thus, when the automatic process, under the most favorable circumstances, undertakes to send messages to great distances, its capacity is found only one half that of the system it proposes to supplant. When it uses repeaters to accomplish its purpose, then it places itself upon the exact conditions of Morse manipulation minus the time and labor and risks of error in preparation. Even in a circuit of 400 miles, using the largest wire in use on American lines, we have Mr. Prescott's testimony that the average rate by the

Morse system could not be exceeded by the automatic process. In short distances greater speed is no doubt possible, but the consciousness of this difficulty has compelled the selection of wire of double capacity for the line now building between Washington and Baltimore.

THE COST.

In Europe the machinery necessary in an automatic office we find classed and valued as follows :

1 Puncher................	200 00 Thalers	
1 Handle Puncher for correcting.............	60 00 "	
1 Transmitter	125 00 "	
		$300 00 Gold
For Morse transmission one key is needed costing....................		$6 00 Currency

When Her von Frischen was asked, "What difficulties do you experience in the present mode of automatic transmission?" he replied, "The great number of employes necessary."

Question. How many employes are necessary in transmitting a certain amount by one instrument?

Answer. Ten persons to prepare ; two to transmit ; two to revise, in all fourteen.

The time of preparation by the various modes is as follows, as we gather from the official reports of the officers of European companies :

	Preparing.	*Sending*	*Total.*
The type process (Siemens and Halske)......................	9 minutes,	½ m.	9 ½ m.
Prussian type process.........	3½ "	½ "	4 "
Punched paper process, (Siemens and Halske)...........	2½ "	½ "	3 "
Prussian punched process 1 to	2 "	½ "	2½ "
Morse system limiting capacity to 1 message per minute, although capable of much more.	none.	1 "	1 "

To use the language of Prof. Morse's report, "The punched paper process required eight perforators and eight employes to accomplish what the Morse, with but one operator, accomplishes in very nearly the same time.

RECEPTION.

So far we have only followed the message to the transmitting machine and estimated its chances of propulsion under the automatic stylus. Let us now see its reception. Suppose now a message of 500 words is put between the rollers of the transmitter, and that even in ten minutes, or twenty per cent. faster than is claimed for the most perfect and rapid of European automatic methods the message is sent to its destination. The receiver cannot and is not expected to detect its errors as an intelligent Morse operator frequently does. His hands are busy bearing from the machine 16 yards of tender paper ribbon upon which the message is written. He cannot stop the transmitter because of any failure of the current to perform its work caused by defective paper or by any failure of the stylus to keep its course over the punched message. He passes it over to others to be translated and copied. It has to be carried to a desk—this pack of paper ribbon—to be straightened out, read out by one person and copied by another, or cut into parts and copied by half a dozen to insure prompt delivery. Such a process staggers patience and would make a Morse operator weep. Either the message must take twenty minutes to be copied by a writer and reader, or in five by half a dozen, on half a dozen different sheets and in half a dozen chirographies, to be arranged as best they may, and delivered to their address. This same message handed to a single Morse operator is not only sent but received and copied by a single receiver without a moment's preparation, in the same time as the other has taken to punch it ; can be sent and received and copied a second time while the perforated message is being corrected ; can be sent and received and copied a third time while it is being passed under even the automatic stylus ; and can be twice sent, received and copied during the process of handling and arranging, and translating the basket full of ribbon upon which the automatic process has inscribed the message.

It will be found on examination, that while in the automatic system, as now proposed, labor is multiplied, practical speed and efficiency is diminished. The risks of error increase with every new hand made necessary to perform the work. The Morse system, in exquisite contrast to such a method, places two intelligent men at any distance apart, face to face, one with his key and the other with his pen, touching each other by the living wire through which they speak, checking each other's errors, conscious of each other's presence, hearing sometimes the finger slip from the key and almost the pen scratching its way over the paper, with only the click of a magnet an inch and a half long, and a simple key to perform the operation of transmission and with a speed unexcelled ! while the automatic system now proposed demands a dozen persons to perform a like service, between whom machinery, varied and costly, prevents contact and elaborates and hardens toil. Such is not the automatism of our dreams.

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THE strike of the Western Union Telegraph Company and the manner of its management has excited wide attention, and is affecting the policy of companies elsewhere, of which the last Erie strike is an example.

Gone to Darien.

Accompanying the government officers sent to survey the territory through which the Darien Canal is expected some day soon to be cut, are several telegraphic experts whose duty will be to keep up communication between the surveying parties. Among these are Messrs. W. H. Clarke, formerly night manager of the Western Union Telegraph Company, Washington, D. C., who acts as chief; Mr. A. J. Gustin, of the night service of the Western Union Telegraph Company, 145 Broadway, N. Y., as first assistant, and Mr. McDowell as second assistant. These gentlemen sailed for Aspinwall Tuesday evening, January 25th.

Floating Electric Telegraph Stations.

A communication was received from Walter Hearn, Secretary of the Philadelphia and Southern Mail Steamship Company, asking the association if they would assist in the establishment of floating electric telegraph stations, similar to the one now in process of construction in England, and intended for use fifty or sixty miles off Penzance. He claimed that such stations would be of incalculable benefit to the shipowners and the mercantile community generally, saving time, expenses, being able to chronicle the weather, with many other feasible advantages. The project was favorably received by the association and a committee appointed to act upon the matter.

The Fire Alarm Telegraph.

THE NEW SYSTEM TO BE IN WORKING ORDER DURING THE PRESENT MONTH.

The fact that the Fire Commissioners have determined to supplant the present imperfect method of communicating alarms of fire has been announced in the *Times*, and we have also given a full description of the improved system which has been adopted and has been for some months in process of construction. The work is being done, as heretofore announced, under contract with Messrs. C. N. & J. T. Chester, who have pushed it with such vigor that it is expected that the new fire alarm telegraph will be ready for use by the 20th inst. The poles are already up in nearly all parts of the city, the wires are being rapidly placed, and the work of affixing the alarm boxes to the posts has already been commenced. Meantime preparations are being made for the reception of the new apparatus in the building used as headquarters of the Fire Department at No. 127 and 129 Mercer Street. The whole lower floor, now partly used as an operating room under the present system, will be occupied by the batteries of the new telegraph, the operating room having been arranged on the second floor in the apartment in the rear of the Chief Engineer's office, into which enter from the rear 120 wires. In all other respects the work of furnishing the city with a perfect method of giving alarms of fire with the greatest possible speed and accuracy is in an equally forward state, and the Commissioners are confident that during the present month the new system will be entirely established and in thorough working order.

The cost of the improvement, it is admitted, will be great, but will be more than balanced by the decided advantages expected from the new system, which is expected to materially reduce the annual loss by fires, by multiplying the number of stations from which alarms can be sent, and also in the unfailing accuracy with which the signals can be sent, so that there need not be any delay in the arrival of the engines at the required spot. In working expenses the new system costs less than the old, as it abolishes the bell tower signals, now maintained at an expense of $33,000 in salaries of bell ringers alone.

◆

ON account of the strike, the reports of December have been delayed, and we are obliged to go to press, without the usual official statement.

◆

WE acknowledge receipt of Prof. B. A. Gould's report to the Superintendent of the United States Coast Survey of the transatlantic longitude as determined by the Coast Survey Expedition of 1866. It is published by the Smithsonian Institution, Washington, D. C., and is one of a series of "Smithsonian Contributions to Knowledge." It is a finely printed and eminently entertaining communication, which we design to read carefully and give parts of our reading to our readers. It shows how important an element the telegraph has become in scientific navigation, especially in the class of astronomical observations by which the points of the earth's surface are determined. The electric spark, the telescope, and the star are accomplishing what the finest chronometers utterly failed to secure.

◆

WE acknowledge the receipt of three pamphlets by G. W. Hough, A. M., Director of the Dudley Observatory, Albany, N. Y., each of which are valuable additions to our own knowledge, and for which we express our thanks.

1. Velocity of the Electric Current over Telegraph Wire.
2. Remarks on the Galvanic Battery.
3. Total Eclipse of August 7, 1869.

There is a popular desire for knowledge of this character which render publications of this character eminently acceptable and which we therefore welcome.

Influence of the Oath.

The following, kindly given to us by Mr. David, formerly the universally esteemed Superintendent of the Fourth District of the Central Division, very clearly reveals the true feelings with which the better men went into the strike, and which we publish, to mitigate any extreme condemnation of the strikers as a whole:

Columbus, O., January 13.

Mr. T. B. A. David:

Dear Friend: Your kind letter received last evening. I cannot express to you what my feelings were upon its receipt. We had already gladly dissolved, and renounced all connection with the League. We were drawn into the strike very much against our will. We only quit because of the oath we had taken, and as soon as we could honorably do so we returned, and will never be caught in such a fix again. In joining the League, we supposed we were joining an honorable body, which would try to elevate the standard of the profession by gradually inducing men to quit drunkenness, &c. It will be a matter of serious regret to me throughout my entire life that I was ever connected with this disgraceful movement. The League was virtually a dead letter, no matter what the result of the strike, as nearly, or all the reliable men are as much disgusted with strikes as we are. Mr. Williams reinstated us, but General Stager has ordered the suspension of all. This to me is a great humiliation; still, perhaps I deserve it. Though I think, under the circumstances, I could not have acted differently. Had I thought a strike was meditated, I would have used my influence to have this Circuit abandoned.

When it occurred I was sick a bed, but felt myself bound just as much as the rest, and very likely would have felt bound to have gone with them, had I been here. The boys here went out (protesting) to show that they had no heart in the matter, and were sorry they left.

Truly and respectfully yours,

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We make the following correction in the report of the strike at Burlington, Vt.:

"Only one operator in this office struck, and he, seeing the error of his ways, returned to duty, after being out in the cold a few days. Business was not delayed one minute on account of the strike in this office.

"H. W. Drury, Manager."

Prof. Morse's Likeness.

To gratify several who desire it, we have had Prof. Morse's likeness, as published in Vol. 2, carefully printed on heavy plate paper, and which we will send, post paid, wrapped on a roller to prevent injury, on receipt of twenty-five cents.

◆

The Good Time Coming.

The gradual, yet certain, progress of the work of girding the earth by the electric telegraph, and thus interlacing the hearts of the peoples by an intimate and, let us hope, friendly communion, is noticed in our pages from various sources and different points of apposition, so that we may confidently rejoice that, having been forced to speak of public misery, crime, diplomacy, and may be tyranny, politics, law, revolts, and executions, we can, on the very same day, chronicle the successful spread of the mission of the scientific evangelism which is destined to redress them by the disenthralment of mind, and "the refinement both of governments and churches.—*Herald.*

An Unintentional Slander Refuted.

Southern Division,
Superintendent's Office, 3d District,
Augusta, Ga., January 21, 1870.

Editor Journal of the Telegraph:

Dear Sir.—In the Journal of the 15th inst., page 43, a very gross injustice has been done to my district by the publication of the following: "On January 10th, at noon, two southern districts, under Superintendents Brenner & Dowell, &c., &c., struck." So far as relates to the 3d, this statement is untrue, and grossly unjust.

I was not only astonished, but provoked, to find that the official organ of the company had published so *gross a libel* upon *men* whom I and the company have just reason to be proud of, who, from the first moment of the strike, refused all persuasion, and proved their fidelity to the welfare and interests of the company by the most arduous and untiring efforts to work off the accumulated business, and at all hours of the day and night. Whilst others were enjoying either amusements or calm repose, the employes of this district were only to be found at their posts, and night after night did they give willingly and cheerfully to the company's business, toiling faithfully till relieved for breakfast the following morning.

I feel it a duty, therefore, to request that this stigma be removed, and that you do them the justice that truth and fidelity entitles them to and demands.

Very respectfully,
J. A. Brenner, Superintendent.

[We are glad to know that the Brenner District stood loyal to its work. We obtained the information which we published from press reports. We regret every such error, and acknowledge them gladly. So the libel is removed. We like to see a man genuinely angry. It shows earnestness. Give us your hand, friend Brenner. It's all right. Hurra for the third district!]

◆

The telegraph operators ought to keep on striking until they have pummeled the breath from the bodies of the mercenary rascals who ordered the demonstration. In doing this, the latter portion of their strike would somewhat offset the bad character of the opening part.—*Chicago Times.*

◆

There is one Pope who is not infallible. He is the fellow who ordered the telegraph strike. People salute the toe of the Roman Pope. The American Pope should be saluted by the toe of every sensible man's boot.—*Chicago Times.*

◆

A patent has recently been granted for a method of refreshing horses while in harness, which consists in making the bit hollow, and having perforations in it. A rubber tube extends from one side of the bit to the carriage, and by pressing a rubber bag which contains water, the driver is enabled to refresh his horse whenever he chooses without stopping. For saddle horses the water bag is suspended from the horse's neck, or upon the pommel of the saddle.

◆

France.

CABLE MONOPOLY TO BE ABOLISHED.

Paris, Monday, January 31, 1870.

The journals of to day state that the French Minister of the Interior, in reply to a demand of an English Company for the privilege of laying a cable from Algiers to France, replied in effect that hereafter all monopoly in telegraphic cables would be abolished, and that even private parties were at liberty to lay cables.

TARIFF BUREAU.

Semi-Monthly Circular.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
February 1, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since January 15, the date of the last tariff order. Please note them in your tariff book:

NEW OFFICES.

A number of offices named below were heretofore other line offices, and are so marked in the book. Tariff will hereafter be taken by the square.

75 Athens, Pa.
96 Amelia C. H., Va., re-opened.
Birmingham, Pa., 15 more than Pittsburg, ck. Pittsburg.
65 Berkshire, N. Y., re-opened.
170 Bloomfield, O.
346 Cleveland, Ill.
Centralia, Ks., 45 more than Atchison, Ks.
66 Centralia, Pa.
66 Delano, Pa.
346 Erie, Ill.
* Excelsior, Northumberland County, Pa.
Frankfort, Ks., 30 more Atchison, Ks.
37 Georgetown, Conn.
69 Glenn Mills, Pa.
130 Grant, N. Y. (P. O. address Brockenstraw, Chatauqua Co., N. Y.)
200 Hilliards, Mich.
266 Jacksonville, Ala., re-opened.
346 Lyndon, Ill.
369 Labadie, Mo.
83 Locke, N. Y.
75 Laceyville, Pa.
56 Lackawanna and Bloomsburg Junc., Pa.
240 North Lansing, Mich.
456 Milton, Iowa.
75 Meshoppen, Pa.
66 Mahanoy City, Pa.
18 North Dighton, Mass., re-opened.
231 Osseo, Mich.
86 Penola, Va.
66 Penn Haven Junc., Pa.
66 Quakake Junc., Pa.
357 Robinson, Ill.
346 Rock Island Junc., Whitesides Co., Ill.
346 Rock River Junc., Ill.
Solomon, Ks., 60 more than Lawrence, Ks.
351 Senatobia, Miss.
18 South Abington, Mass.
65 State Bridge Station, N. Y., P. O. adds. Messengerville, N. Y.
66 Shenandoah, Pa.
18 Somerset, Mass.
75 Towanda, Pa.
75 Tunckhannock, Pa.
75 Ulster, Pa.
75 Wyalusing, Pa.
66 Weatherley, Pa.
Wetmore, Ks., 30 more than Atchinson, Ks.

NEW OFFICES ON OTHER LINES.

Excelsior, Northumberland Co., Pa., 35 2 Philadelphia or Harrisburg, Pa.

OFFICES CLOSED.

Lexington, O., Ferris, Ill., Remsen, N. Y., Big Run Branch, Pa., Jonesboro, Ind., Xenia, Ind., Kentland, Ind., and Dalton, Ill.

TO OFFICES HAVING SPECIAL SHEET A.

Hereafter tariff to Herkimer, N. Y., will be same as Ilion, N. Y., and Plymouth and Kingston, Pa., same as Wilkesbarre, Pa.

GENERAL INFORMATION.

The name of the office heretofore known as Round Grove, Mo., has been changed to Beverly, Mo.; Lyndon, Vt., to Lyndonville, Vt.

The tariff for other lines from Philadelphia and Harrisburg to Cornwall, L. Co., Pa., has been reduced to 50 and 4.

Messages may be received for Lyndon Centre and Lyndon Corner, Vt. Charges for delivery are 50c. for the first, and 75c. for the second from Lyndonville, Vt., ck. Lyndonville, Vt.

Evans, Cal., in Journal of January 1 should read Evans, Col.; and Cau Station, Cal., and Tan Farm, Pa., in last Journal, should read Carr Station, Col., and Tarr Farm, Pa., and in Journal of Dec. 15, Peubla and Trinidad, Cal., should read Pueblo and Trinidad, Col.

William Orton, President.

Telegraphers' Mutual Life Insurance Association.

We regret to have to make the following announcement:

Superintendent's Office, 7th Dist.,
Cincinnati, January 26, 1870.

Gerrit Smith,
Secretary T. L. I. Association,
145 Broadway, New York.

Dear Sir,—I am sorry to be obliged to inform you of the death of Milton B. Graham, a member of our Association, at eleven o'clock this morning. The cause of his death was consumption. His family, I believe, are in needy circumstances.

Very respectfully,
Geo. T. Williams,
Superintendent.

ASSESSMENT NO. 10.

William Cannon,
J. M. Rhoades,
J. P. Fowler,
F. H. Seibert.

RECEIPTS—ASSESSMENT NO. 11.

John Fuller,
C. G. Merriwether,
D. D. Malbry,
Henry H. Ward,
W. H. Steigelmeir,
Henry L. Barber,
Ch. D. Sprague,
Joseph Hanson,
J. W. Ray,
John C. Thomas,
Julian Soule,
Wm. M. Pepper,
Joseph Elwyn Powell,
Martin Barth,
John A. Conley,
Thomas Johnson,
C. J. Depew,
L. E. Curtis,
Stephen D. Jaynes,
John W. McDonald,
Marcus A. Erwin,
John Doran,
Hugh D. Scott,
C. P. Mathews,
Walter D. Mann,
G. Wheeler Robinson,
Bennett A. Pryor,
J. D. Reid.
William Holmes.

It is now nearly four months since a death has occurred in the Telegraphers' Insurance Association. The nominal membership is over 700.

The British Government assumes control of the telegraph to-day.

The various cable routes to India will be worked by a common interest.

* * *

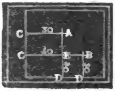
Mr. Washburne is in the field again with a bill providing for taking the telegraphing business out of the hands of private individuals and corporations, and giving it to the Post Office Department. He would forbid absolutely, after July 24, 1871, all persons except those employed by the Government to receive money for the transmission of telegrams. He is modest enough, however, in his views of the value of the service. Twenty cents is to be the uniform tariff for messages of thirty words or less, including, date, address and signature, with one cent added for each additional word. The press is to be accommodated at even lower figures. No franks are to be allowed, and secrecy is to be insured by heavy penalties for divulging messages. Stations are to be established at every town and village, and a system of telegraph money orders are to be arranged. All this looks very nice on paper, but remorseless logic of facts makes short work of it. There is no sort of ground for expecting that the telegraph, under the proposed new system, would be any more efficient than it now is; and judging by the way the Post Office Department is administered, it would probably be less so. As to cost, it might be pleasant enough for senders of telegrams to pay twenty cents where they now pay a dollar or more, but their saving would be the loss of the general taxpayer. The corporations who now do the business are compelled by competition among themselves to cut rates down to the lowest possible point, and they are managed much more economically than any Government bureau ever was or ever will be. The whole scheme is absurd, and will be pronounced so as soon as it comes up for discussion in Congress.—*New York Sun.*

A New Plan for a Tariff Base.

Instead of squares, enclose the offices in one large square.

Let the tariff book contain the names of the offices, with their distances, from the base of the square set in one column, and their distances from the right hand line of the square set in another column, directly opposite the names. An air-line distance being desired as a basis for a tariff between given points, the difference between the distances set opposite these points in one column will be the base, and the difference between the distances set opposite these points in the other column will be the perpendicular of a right angle triangle, the *other* line of which will be the distance sought.

To obtain the distances for the tariff book, would, for six thousand offices, require twelve thousand measurements and notations of results; allowing one minute to each measurement, would give twenty days, of ten hours each. Matter properly made up for one book could be reproduced to any extent by the printer. Each book would contain the basis of *all* the tariffs on the lines; instead of the tariff from the office, in which the book is held, to all others.



A to C being 30 miles, E to C is also 30 miles. E to C being 30 and B to C 40, B to E is 10. B to D being 50, E to D is also 50. E to D being 50 and A to D being 60, A to E is 10. We thus have a triangle A, B, E, whose known sides are 10 miles each. This known, the other line may be readily found, by the rule for such cases.

◆

EDITOR JOURNAL OF THE TELEGRAPH:

My construction of the following seems to be incorrect:

"In transmitting half rate messages, the operator will write the word 'Red' before he begins the same, in order to notify the receiving operator that a half rate message is coming, which must be copied upon a No. 44 blank."

Should the word "Red" precede a half rate message, whether being sent to place of destination or not? I am of the opinion (judging from the latter clause of the foregoing) that it is unnecessary, unless being sent to place of destination.

Your attention to the above will oblige

Very respectfully,
Chas. A. Thornton,
Columbus, Miss.

The word "Red," in order to distinguish the message when it reaches its destination, as is the design of the order, must be placed on all repetitions of it necessary in its transit thereto. We cannot see how it can be left off at any point, and yet fulfil its purpose.

◆

A Western editor thus charged his pen with electricity: "Vivid flashes of resplendent and slippery lightning penetrate the recesses of our sanctum, and make the garret as light as day. Without, the concentrated balls of electricity are promiscuously mixed, jarring and tumbling against each other with that peculiar force which frightens timid young ladies, and awakens babies from their sweet sleep."

◆

The telegraph line from Yokohama to Jeddo is nearly completed.

Get Up!

Elmira, N. Y., November 21, 1869.

EDITOR JOURNAL OF THE TELEGRAPH:

Dear Sir: I hasten to comply with your invitation in the last Journal to all your readers, that their faces may be seen around the family board the coming year. I wish to remain among the number and to partake of the good things that you promise to provide for us.

Perhaps it may interest you to read a description of the telegraphic alarm which I have rigged up to wake us up these cold dark mornings. I have a very fine main line sounder arranged so that it will connect its circuit when the lever is raised, by means of a light spring which allows the lever to play very fast and to strike both points loudly. This instrument is placed in the bedroom, and the wires run through the clock in the sitting-room. The clock I arranged so as to connect the circuit at any hours we choose to set it. We close the circuit when we retire at night, and when the clock arrives at the hour set the armature begins to vibrate, and keeps up the racket until some one gets up to disconnect the circuit. It won't run down or stop for you to turn over and go to sleep again. It keeps calling and you must answer.

Look out for that dollar and send along your paper for another year. Yours truly.

R. L. Guion.

◆

Answers to Inquiries.

Q. How many words are there in the following message?

"Brand of iron is called Glengarnick pig-iron."

A. Eight words. "Pig-iron" is no more one word than "malleable iron," which no one would think of calling one word.

Q. Can I send a half rate message to New York, my regular rate being 35 cents?

A. No messages are received less than 20 cents, as may be seen by Executive Order No. 94, Journal, Dec. 15, 1869.

"Almond," N. Y., is informed that we believe no present demand exists of the kind stated.

◆

At the Bricklayer's National Convention, in Chicago, yesterday, a letter was read on behalf of the operators, saying that they had determined to fight the Western Union monopoly until they had achieved a complete victory, and to that end they were rejecting offers of compromise. Whereupon the bricklayers resolved to proffer material aid at once. Look out for the brick bats.—*Brooklyn Eagle.*

◆

London, January 26, 1870.

The new Cable, which has recently been successfully laid between Salcombe, England, and Brignognan, France, is of the most solid description of deep sea cable, weighing 8¼ tuns to the mile, and the shore ends, 14 tuns. Double land wires will shortly be completed to connect the Cable with the land systems of telegraphs in both countries. By this means messages will be transmitted directly from Brest to London, without passing through Paris, as at present. The completion of this new link, which has been much retarded by bad weather and other unfavorable circumstances, will place London and New York in almost direct communication, and the whole route will be under the management and control of the French Cable Company.

◆

A submarine cable has been ordered, which will be laid along the Pacific coast of South America, from Panama, to Payta, Peru.

◆

On the 28th the telegraph line between Tampico and Jalacingo was inaugurated.

Journal of the Telegraph.

The Second Persian Gulf Cable.

[From the Bombay Gazette.]

It may be remembered that more than a year ago the government decided to submerge a second telegraph cable in the Persian Gulf, extending from the Bushire to Jashk on the coast of Mekran. At the present moment there is a double line of communication from Kurrachee to Jashk—the one by submarine, the other by aerial telegraph; and from Bushire to England there is the line by Turkey (just now unfortunately interrupted by the Arabs), and a second through Persia and Russia, the organization of which at Messrs. Siemen's hands will not, in all probability, be thoroughly carried out until the end of November. The laying therefore of the second cable between Jashk and Bushire, will complete the duplicate chain of communication between India and Europe, and will relieve the old cable from a weight of traffic already nearly too much for its capabilities.

◆

New York Telegraph Ball.

We are informed by parties who were present that the Ball of the Operators at Apollo Hall, New York, January 18th, was a very decided success. In point of numbers present it compared favorably with that of any previous occasion, and was conducted throughout with much energy and good taste. The following are the committees:

RECEPTION COMMITTEE:

M. H. Redding, Chairman.

J. B. Oltman,
M. K. Tompson,
W. O. Lewis,
T. T. Dennis,
M. S. Roberts,
W. H. Collins,
W. H. Hill,
J. W. Burnham.

FLOOR COMMITTEE:

John C. Stewart, Director.

ASSISTANTS:

A. H. Watson,
Henry Bertram,
J. B. Collins,
John McKeachie,
Geo. W. Roberts,
Floyd Grant,
Thos. Brennan,
P. Collins.

◆

At the annual meeting of the American Compound Wire Company held in the city of New York, January 26th, the following gentlemen were duly elected officers for the ensuing year:

Chester Snow, President.
Alanson Cary, Secretary and Treasurer.

DIRECTORS:

Chester Snow,
Alanson Cary,
L. G. Tillotson,
M. G. Farmer,
Geo. F. Millican,
James O. West.

The affairs of the company are reported to be promising, the sales of the past year being three times greater than the year preceding, and the orders for January in excess of the whole of the past year. The recommendation of the wire is increased conductivity, reduced weight and added strength.

◆

A writer in *Once a Week* states that an omnibus driver in London assured him that he knew an infallible remedy for rheumatism, which was to steal a potato and carry it in your pocket. "Shortly afterward, mentioning this to a gentleman who has made his fortune in trade in the city, he produced from his pocket what appeared to be a flat, black pebble, which he told me was a potato that he had stolen, and had carried about in his pocket till it had shrivelled up to its then state. He assured me that its effects in relieving him of the pain had been marvellous, but that it had got worn out now, he supposed, from the time he had had it, and he thought he must steal another, as the pains were returning."

SPECIAL NOTICE.

GRAY & BARTON,

(Manufacturers for the American Private Line Telegraph Company.)

Beg leave to announce that they have removed their Chicago works from 162 South Water Street to

No. 13 LaSALLE STREET,

And have added thereto a large amount of new Machinery and Tools, especially adapted to the manufacture of all

TELEGRAPH AND ELECTRICAL INSTRUMENTS.

They are prepared to supply orders for

MACHINERY OR TELEGRAPH SUPPLIES

of all kinds and descriptions at brief notice.

Our machinery will be of the latest and most approved designs, and special advantages have been secured for furnishing instruments of the patterns of the Caton and Western Union Shops, the high reputation of which will not suffer at our hands.

We call the attention of all interested in the working of Telegraph Lines to the fact that we make first-class RELAYS with a resistance of only from six to twelve miles, and make no Main Line Magnets with high resistance except to order.

Hereafter all our Relays will have the resistance of each instrument accurately measured and marked on the base.

SOMETHING WORTH HAVING.

SPLENDID CHROMOS OF
GRANT, LINCOLN AND SEYMOUR,
AT LOWER PRICES THAN EVER BEFORE OFFERED.

LINCOLN, 9x11	50 cents.
GRANT, 9x11	50 "
SEYMOUR, 8x10	30 "

Sent Single on receipt of the price to any address, postpaid.
The three Chromos sent postpaid on receipt of $1.
Address— T. J. HYATT,
(Office of John Polhemus,) 102 Nassau Street, New York.

Forms for Telegraphic Messages.

The British Post Office authorities have prepared for the use of the public, forms for telegraphic messages to be used when the whole system of inland telegraphs is acquired by the government. The form is very simple and complete, and differs in one or two important respects, from those hitherto employed, by those of the companies. The novelties—the principal of these refers to the arrangement of the words that make up the message. A separate space in lines is allotted to each word, and the corresponding charge is printed clearly on the margin, so that the sender can see at a glance how much he has to pay, and the receiving clerk need be at no trouble in calculating how much he has to charge. Each of the forms thus divided into spaces is prepared for a message of fifty words, which is assumed to be sufficient in the great majority of instances. In the right hand upper corner of the page a blank space is left for the stamps, which will probably be almost exclusively used to cover the charge of transmission. Attached to the form are directions for the guidance of the sender, with a tariff of charges, and full information as to the arrangement for porterage.—*Evening Post.*

◆

Electricity as a Heating Medium.

Experiments have been made at the Hotel Dieu Hospital, Paris, of an electrical heating apparatus, the trial of which has been so successful that it is proposed to warm all the other hospitals of Paris with it, instead of coal.

FRANK L. POPE,
TELEGRAPHIC AND ELECTRICAL ENGINEER,
Nos. 78 and 80 Broadway, Room 48,
NEW YORK.

AMERICAN FIRE ALARM
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POLICE TELEGRAPH.
GAMEWELL & CO., PROPRIETORS,
NO. 104 CENTRE STREET, NEW YORK.

This system of Fire Alarm Telegraph, with a central office, or upon the

AUTOMATIC PLAN,

is now in operation in the following cities, to which reference is made for evidence of its great SUPERIORITY AND VALUE, and UNIFORM reliability:

BOSTON,
CHICAGO,
PHILADELPHIA,
CINCINNATI,
ST. LOUIS,
BUFFALO,
BALTIMORE,
MOBILE,
NEW ORLEANS,
PITTSBURG,
LOUISVILLE,
ALLEGHENY,
MONTREAL,
QUEBEC,
PORTLAND,
ST. JOHN, N. B.,
HARTFORD,
TROY,
NEW HAVEN,
ROCHESTER,
SPRINGFIELD,
TOLEDO,
ALBANY,
COLUMBUS,
LAWRENCE,
MILWAUKEE,
SAN FRANCISCO,
CAMBRIDGE,
WASHINGTON, D. C.

The distinctive features of
THE AMERICAN FIRE ALARM TELEGRAPH
are a Combination of Circuits, the Automatic Signal Boxes, Electro-Mechanical Bell and Gong Strikers.

THE AMERICAN FIRE ALARM AND POLICE TELEGRAPH is covered by some twenty patents. Very early after its introduction into Boston, Gamewell & Co. purchased the original patents of Farmer & Channing, and during the past fifteen years have spared no expense or pains to improve and perfect this system.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

THE STANDARD
AMERICAN WORK ON THE TELEGRAPH.
MODERN PRACTICE
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BY FRANK L. POPE.
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"Your illustrative diagrams are admirable, and beautifully executed. * * * *

"I think all your instructions in the use of the telegraph apparatus judicious and correct, and I most cordially wish you success."—Prof. S. F. B. Morse.

"There is no other work of this kind in the English language that contains in so small a compass, so much practical information in the application of galvanic electricity to telegraphy."—Prof. G. W. Hough, Director of Dudley Observatory.

"I have read the book carefully through and have been both interested and instructed by it. It is just the sort of book that was wanted in America—clear and to the purpose."—Robert Sabine.

"I feel assured that it will prove of great value to all interested in the science or practical details of the Electric Telegraph, and supply a deficiency that has long existed."—Gen. Anson Stager.

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"There was a felt necessity for just such a work as Mr. Pope has given us. * * * There are portions of the work which no operator can afford to be without."—*The Telegrapher.*

"From a careful perusal of this work we are assured that it supplies a long felt want. * * * It will tend much to improve the knowledge of electricity and practical telegraphy amongst the operators."—*London Mechanics' Magazine.*

"We cannot err in commending the book to all who desire accurate knowledge in the art in which their life and labor are so much connected."—*Journal of the Telegraph.*

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DEVOTED TO THE

Interests of the Telegraph in the United States,

And a record of its progress throughout the world.

Published on the 1st & 15th of each Month,

AT THE

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145 BROADWAY, NEW YORK.

The JOURNAL OF THE TELEGRAPH is the official organ of the Western Union Telegraph Company, through which are promulgated, for the information of the Stockholders and public, authentic details relating to the financial affairs of the Company—embracing a monthly statement of earnings, expenditures and net profits—and the orders of the Executive Officers to the employes. In its columns will also be found accurate and valuable information in regard to the operation and extension of the lines, and a full discussion of all other matters of a scientific or general character pertaining to the telegraphic art.

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11 DEY STREET, NEW YORK,

AND

BLISS, TILLOTSON & CO.,

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Respectfully inform their customers, and all parties purchasing

TELEGRAPH AND ELECTRIC MATERIALS,

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SAMUEL C. BISHOP, OF NEW YORK,

General Agents for the sale of any articles manufactured by him

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They are now prepared to fill promptly any orders for goods on hand, or to be manufactured, at Mr. BISHOP's prices in New York.

The long experience of Mr. BISHOP in the manufacture of

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and the reputation he has gained and enjoys for the superior quality and perfection of manufacture of his

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AND

INSULATED WIRES,

of various kinds, insulated with pure Gutta Percha, renders this arrangement a very important one for our numerous patrons throughout the country, and we confidently recommend these goods to their especial notice as being fully equal, if not superior, to any other in use.

The principal articles manufactured and offered for sale are

SUBMARINE TELEGRAPH CABLES,
(Any size required.)

Gutta Percha Covered Telegraph Office Wires, in great variety of size and style.

Subterranean Wires, covered with Gutta Percha and Lead outside, various sizes.

Subterranean Wires with Gutta Percha and braided fibre, and Bishop's Patent Compound outside.

Subterranean Wires, with Fibre and Bishop's Patent Compound outside.

Pole Line Cordage, with Fibre and Bishop's Patent Compound outside.

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Bridge's Patent Double Covered Cordage.

BISHOP'S PATENT COMPOUND WIRE

for out-door use and office connections.

INSULATED WIRES,

with two Conductors, both plain and with braid outside, and great variety of other kinds made to order.

Cotton and Silk-Covered Wires, both twist and braided.

This arrangement with Mr. BISHOP, together with our own extensive Manufactory in New York, and our great variety of Telegraph Material in stock, fully establish our claim that our stores are the depots of telegraph supplies in this country.

Telegraphers'
Mutual Life Insurance Association

INCORPORATED UNDER THE LAWS OF THE STATE OF NEW YORK.

I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and th payment of dues.

XI. A meeting for the election of officers shall be held annually during th first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written reques of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer.

GERRITT SMITH, Secretary.
A. S. BROWN,
W. H. HILL,
D. R. DOWNER,
Executive Committee.

DIRECTIONS TO APPLICANTS.

1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to Gerritt Smith, Secretary Telegraphers' Mutual Life Insurance Association, 145 Broadway, New York, and a certificate of membership will be sent by return mail.

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

5. No letters can be answered unless a stamp is enclosed for postage; and as the officers labor without compensation, correspondence requiring answers should be as limited as possible.

By permission of the Western Union Company, and to avoid risk by mail, remittances may be made by an order signed by a Manager on John Horner, Cashier, New York office. Whenever practicable it is desirable this should be done.

WE read in the *Press* the results of the numerous observations of the corona made in America during the late solar eclipse, as briefly summed up as follows: First, that it is not flame, since the spectrum exhibits no dark line; second, that it is not reflected light, *i. e.*, light emanating from an incandescent body, and reflected by the particles of its atmosphere—because it is in no degree polarized; third, resting solely on the authority of Prof. Young—that it is identical in nature with the aurora borealis, showing in its spectrum three characteristic *bright* lines. Confirmation of its electrical origin is found in its shape. It attains greatest extent in the direction of the ecliptic, and the next greatest at right angles to that line.

◆

DANGER OF HAIR DYES.—Doctor Witherway, a physician of Iowa, died recently from the effects of poison slowly introduced into his system by a continued and daily application of dye to his hair and beard. He persisted in it for four years, notwithstanding severe pains, which he compared to lead colic, warned him to desist. The autopsy and chemical analysis brought to light the presence of lead in his liver and also in one of his loins.—*Cosmos.*

◆

CORNS.—The pain occasioned by corns may be greatly alleviated by the following preparation: Into a one ounce phial ask a druggist to put two drachms of muriatic acid, and six drachms of rose water. With this mixture wet the corns night and morning for three days. Soak the feet every evening in warm water without soap. Put one-third of the acid into the water, and, with a little picking, the corn will be dissolved.

CHARLES WILLIAMS, Jr.

109 Court Street,

BOSTON, MASS.,

MANUFACTURER OF

TELEGRAPH INSTRUMENTS,

BATTERIES,

AND MATERIALS OF ALL KINDS.

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A. BOODY. C. S. OTIS.

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AND EVERY DESCRIPTION OF TELEGRAPH SUPPLIES,

Offer the best guaranty of excellence in their profession—in their long established business—in the extent and variety of their manufacturing facilities—in the many improvements introduced by them, now almost universally adopted or imitated—and in the extent of their business, domestic and foreign, enabling them to keep pace with telegraphic progress.

They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer.

CHESTER, PARTRICK & CO.,

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Now offer for sale, or will manufacture to order,

REGISTERS,
RELAYS,
KEYS,
LIGHTNING ARRESTERS,
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And every variety of Instruments now in use. Among the supplies constantly kept on hand, are the following:

Battery Materials of all kinds, Line Wire, all sizes, Brackets, Insulators, Medical Batteries (induced or direct current), Fire and Burglar Alarms for Banking Houses and Private Residences, as well as for Cities and Towns; also, Contractors for the Construction, Reconstruction and Repair of Telegraph Lines throughout the United States.

All the Standard Works on Telegraphy furnished at the lowest prices, among which is the latest work of

MODERN PRACTICE OF THE ELECTRIC TELEGRAPH,

By Frank L. Pope.

Also, Electro-Platers' Batteries and Materials, Blasting Apparatus, Cartridges and Patent Portable Machinery for the manufacture of Nitro Glycerine.

All orders executed with promptness, and satisfaction guaranteed in the quality of articles supplied.

Improved Telegraph Wire.

The attention of Telegraph Companies and Builders is invited to the Compound Steel and Copper Wire manufactured by the

AMERICAN COMPOUND TELEGRAPH WIRE COMPANY.

Agents in New York,

MESSRS. L. G. TILLOTSON & CO., No. 11 Dey street.

THIS IMPROVEMENT

has already been quite extensively introduced, and it is confidently believed, that by the natural laws of progression, is destined to supersede iron wire for Telegraphs, because of its superior working capacity under all conditions of weather.

THE WEIGHT OF THE COMPOUND WIRE

is but about one-third that of an equivalent conductor of iron, and its conducting capacity may be largely increased with but slight increase of weight. In consequence of this lightness, together with its

GREAT AND UNIFORM STRENGTH,

but one-third of the number of poles are necessary that are required in iron wire construction, thus largely improving the Insulation and combining Economy in Construction and Reconstruction, with superiority in working.

THE WINTER TESTS

have proved its durability and capacity to successfully resist breakage from sleet and wind storms, and one of the testimonials received to this effect states that during a certain severe sleet storm the Compound Wire remained intact, while a high cost Norway Iron Wire, in the same locality, and strung at the same time, was broken in several places.

Address—
AMERICAN COMPOUND TELEGRAPH WIRE COMPANY.
ALANSON CARY, Treasurer,
No. 234 West 29th street,
New York.

Or Agents of the Company.

L. G. TILLOTSON & CO.

11 Dey Street, New York.

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TELEGRAPH INSTRUMENTS

AND

MATERIALS OF EVERY DESCRIPTION.

General Agents for the

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The Compound Wire has now stood every test to which it can be subjected. Over twelve hundred miles of it are now in operation with the most satisfactory results.

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GUTTA PERCHA AND OTHER INSULATED WIRES.

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PURE NITRIC AND SULPHURIC ACIDS,

Manufactured by the Lodi Chemical Works.

Importers of the best manufacture of

ENGLISH GALVANIZED WIRE.

Publishers of Prof. J. E. Smith's

MANUAL OF TELEGRAPHY.

GROVE,
CARBON
HILL'S,
DANIELL'S,

And every description of

BATTERY ALWAYS ON HAND.

GRAY & BARTON,

No. 13 LASALLE STREET,

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and

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CLEVELAND, OHIO,

MANUFACTURERS OF

ELECTRICAL INSTRUMENTS,

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TELEGRAPH
INSTRUMENTS,
LINE and
BATTERY
MATERIAL,

And make to order

ALL KINDS OF

ELECTRIC APPARATUS.

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TELEGRAPH MACHINERY AND SUPPLIES,

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INSULATORS, AND EVERY DESCRIPTION OF

OFFICE AND BATTERY MATERIAL

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INSTRUMENTS REPAIRED AT SHORT NOTICE.

L. G. TILLOTSON & CO., GEORGE H. BLISS,
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Successor to

THE BISHOP GUTTA PERCHA COMPANY.

The Original and Only Manufacturer in the United States of every description of

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INSULATED SUBMARINE TELEGRAPH CABLES.

INSULATED TELEGRAPH AND ELECTRIC WIRE.

The Insulation of Telegraph and Electric Wire with Gutta Percha has been adopted by the manufacturers of these articles, in Europe as well as here, and in an experience of over TWENTY YEARS has never failed.

I also Manufacture

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TISSUE SHEET FOR HAT AND CAP MAKERS' USE

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REGISTER PAPER, MANIFOLD PAPER, MESSAGE PAPER, (IN STRIPS).

Printed Message Heads and Envelopes

On hand and furnished to order.

WIRE, GALVANIZED AND PLAIN,

AT THE

LOWEST MANUFACTURERS' PRICES.

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Of any number required.

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AND

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REGISTERS,
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Of any desired Size and Pattern, American Manufacture.
We shall be happy to answer all inquiries and furnish any required information promptly.

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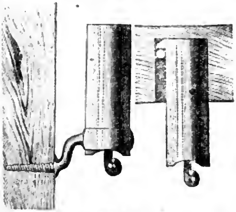
BROOKS'

PATENT PARAFFINE INSULATOR WORKS,

21 ASPEN STREET, NORTH OF 2123 CHESTNUT STREET.

PHILADELPHIA.



The guarantees of this insulator are:

1st. A current resistance in rain or fog, or in rain and fog, combined of 100,000,000,000 Ohmads.

2d. To insulate a conducting wire of any length in rain or fog or rain and fog combined, to its full working capacity, or the capacity of a similar wire or conductor placed upon any other insulators under the most favorable circumstances of weather.

3d. Strength, not to break or part by any strain by, or that a No. 8 wire will bear.

It is not injured by missiles in the general acceptance of the term.

It does not depreciate from exposure to smoke, soot and the gases from combustion to one hundreth part of the extent of ordinary insulators.

It is not injured by atmospheric discharges. It is a protection to the poles from the same effects, there not being an authenticated instance of a pole being injured where these insulators are used.

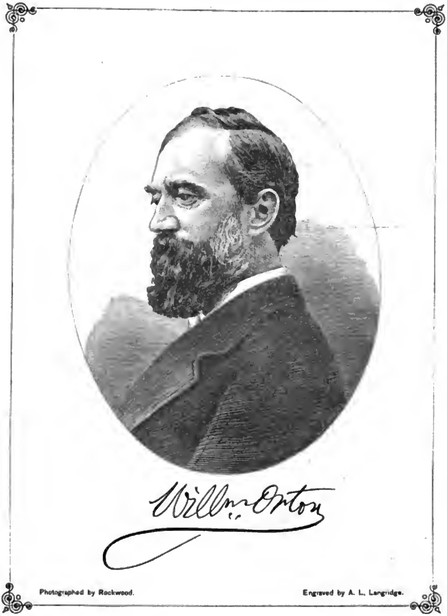
John Polhemus, Printer and Stationer, 102 Nassau Street, N. Y.

JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 6. NEW YORK, FEBRUARY 15, 1870. WHOLE NO. 55.

HON. WILLIAM ORTON.

We have endeavored for some time to procure the likeness of Mr. Orton so as to present to our readers, but until now have been prevented by his personal repugnance to its publication. Although the pose of the portrait now given does not satisfy us, yet we regard it as a fine likeness, and, as a work of art, very superior.



Willm Orton

Photographed by Rockwood. Engraved by A. L. Langridge.

Mr. Orton was born in Cuba, Alleghany County, New York, June 14, 1826, and is, therefore, still a young man. His education was rude and limited so far as he received it from others. Like many other men who have been called to the world's big toils, he has been largely his own instructor, choosing such studies as seemed most needed to aid in working out the practical issues of a laborious life, and to which he has devoted his utmost energy. That study he still continues. He has made, as all public men must make, labor the hand-maid of success. To persistent toil, therefore, directed by a clear judgment, with a determination thoroughly to understand and thoroughly to execute, is Mr. Orton indebted for his present trust and its rapid attainment. It is somewhat significant as a prophecy of the direction of Mr. Orton's future life, that his first thesis was on the Magnetic Telegraph, and was illustrated by a model constructed by his own hand. Thus it happened that when, twenty years thereafter, the control of telegraphic interests were offered him, he accepted it as one who had already mastered its conditions. Herein is the lesson and secret of all true success. She demands persistent toil as the price of all her offerings. It is this lesson which justifies the publicity given to men's lives, and is our own apology in presenting this.

The model referred to may be seen among the curiosities of the Department of Education in Albany.

From the year 1845 to the commencement of the war, Mr. Orton was connected with the book trade, and for the last few years of that connection, was a member of a prominent firm in the City of New York.

In 1862 we find Mr. Orton Internal Revenue Collector for the Sixth District of the City of New York. Here his strongest elements for the first time found development. The duties were new, and the rules governing them crude and elemental. To act safely under them required a clear and appreciative knowledge of the general principles of law. They demanded the utmost firmness, courage and impartiality. All this was done with a vigor and discretion which drew upon Mr. Orton public notice.

In 1865 Mr. Orton was appointed Commissioner of Internal Revenue at Washington, which he conducted with such success as to induce the Secretary of the Treasury to write the following letter on his retirement from the service.

TREASURY DEPARTMENT,
October 26, 1865.

MY DEAR SIR: Your favor of the 25th instant is received. I regret exceedingly the necessity that compels you to resign the very important office of Commissioner of Internal Revenue, the duties of which you have discharged with so marked success. Our official intercourse has been short, but it has been exceedingly pleasant to me, and has been long enough to satisfy me of your great executive ability, your uprightness of character, and your devotion to the government. I can pay you no higher compliment than to say you have filled one of the most laborious, trying and responsible positions in the country, a position requiring great patience, industry, promptness of decision, and nice discrimination, and a thorough acquaintance with the law, in a manner highly satisfactory to the country and the Secretary. Anticipating for you an honorable career in whatsoever business you may engage, and with thanks for the support you have given me in the administration of this great Department. I am, very truly yours,

H. McCulloch, Secretary.

The acceptance of the commissionership of Internal Revenue, having been solely for the purpose of enlarged acquaintance with men and experience in public affairs, so as to re-embark into business under the most favorable auspices, Mr. Orton accepted in 1865 the presidency of the United States Telegraph Company, unanimously tendered him by its board of directors.

No sooner had he entered its duties than he began an exhaustive examination of its affairs, and soon ascertained that the company was sinking money rapidly and largely. A vigorous attempt at economy accomplished something to arrest the accumulating loss. But it soon became evident that new appliances must be used, the line pushed through rapidly to the Pacific and new capital be enlisted to a large extent to give any hope of final success. And there were men of large means who seemed willing to make the experiment. But other counsels prevailed. It became more and more evident that neither the Western Union Telegraph Company nor the United States Company could bear the depleting opposition of the other. And so it happened that by the logic of facts, and by the strong personal will and influence of the executive officers of the two companies, they found safety and success in union. But for this, many a shareholder of either company might have been ruined. In this action, by which the union of the two companies was accomplished, Mr. Orton was sustained unanimously by his own Board.

In the organization of the companies thus united, Mr. Orton was chosen Vice-President, and in 1867 was unanimously elected the President of the Western Union Telegraph Company. The laborious duties of this office he still continues to perform, and must, apparently, be long identified with the executive control of the telegraph interests of the United States.

In connecting himself with the telegraph management, Mr. Orton had the advantage of coming in fresh from the contact of the public men of the nation, with the knowledge of outside public sentiment, and unlimited by the mere schemes of temporary advantage which are so apt to sway those who are connected with the origination of a new enterprise. He came in feeling what society demanded of the telegraph and what must be accorded to that demand. He felt also the need of a system wide and homogeneous, strong, compact, in which executive control could reach every fibre and command the vigorous service of every man engaged in it. These four years in which the telegraph has so greatly developed its capacities, have been to a very considerable extent the outgrowth of these perceptions. He has had able and valuable aid in his associate officers, who have united with him heartily in his views. In what remains to be accomplished the public may be sure of an upright purpose, a will that never "strikes," and unyielding toil to accomplish the most beneficent result.

◆

The question of meteorological observations in connection with commerce, was discussed in the Chamber of Commerce yesterday, and a report of the special committee on the subject was ordered to be placed before Congress. All the aids of science should be extended to our seamen and the shipping leaving our ports, and the advantages of the system of meteorological observations have been so plainly demonstrated in England and elsewhere, that it should have been adopted by our Government long ago.

The Telegraph in Switzerland.

RECEIPTS AND EXPENDITURES FOR 1868

(From the Official Report.)

I. RECEIPTS.

From Internal, International and Transit Messages	$173,695 12
Grants or Allowances from the Communes	8,161 13
Repayment on Account of Construction of Line	374 78
Sundries,	2,086 00
Total receipts,	$184,317 03

II. EXPENDITURES.

Salaries and Commissions	$116,220 83
Traveling Expenses	3,000 00
Office Expenses	13,966 74
Rent	6,997 49
Reconstruction and Repairs of Line	21,023 32
Apparatus	16,397 00
Furniture	1,313 00
Sundries	1,003 75
Construction of New Lines	41,855 91
	$221,780 04
Excess of Expenditures over Receipts	$37,463 01

The item for construction is not charged by the telegraph as administration expenses, but is placed in a separate account, and is paid from a special credit of the government, decreed for this purpose.

Of course the items of $8,161 13 of allowances from the Communes; of $374 78 for repayment on account of construction of line, and of $2,086 00 for sundries, do not properly belong in the table of receipts for telegraphing. If we omit these items from the receipts, and the construction item from the expenses, the account will stand thus:

Current Expenses	$179,924 13
Receipts for Telegraphing	173,695 12
Loss	$6,229 01

The following is a summary of the employes of Swiss Telegraph Service, for 1868:

Direction	13
Inspectors	6
Cashiers	6
Heads of Offices	14
Telegraphists	145
Employes of Post Offices, Toll Gates and Private Establishments serving at stated periods as Telegraph Operators	330
Messengers	35
Total number of Employes	549

Average compensation for services of officers and employes of the Swiss Telegraph, per annum, $211 69.

◆

Electric Telegraph Schools of Instruction have been opened in London, under the Secretaryship of T. Evans Lundy, where a thoroughly practical education is given. The terms are: ladies, three guineas; gentlemen, five to ten guineas. Term of instruction—three hours daily, for two months.

The Milwaukee Protest.

Milwaukee, January 4.

To the Managers and others concerned:

Whereas, The undersigned, telegraph operators, having become members of an association, the Telegrapher's Protective League, so called, believing that if said League be governed by sensible and fair dealing men, would result in great good to our fraternity, but would otherwise terminate to disadvantage of those connected therewith: and

Whereas, We believe the strike now in progress to be uncalled for and unwise, being seemingly an attempt to force our company to reinstate two operators at San Francisco, California, alleged to have been discharged for refusing to submit to a reduction of salary, but as to the truth of which we have no reliable information; and,

Whereas, We believe in giving to telegraph companies a few privileges in the operation of their lines; therefore,

Resolved, That we, the undersigned, henceforth sever all connection with, and refuse to recognize or feel in any way bound to the support of said organization.

Signed,
E. M. Sharp, Ch. Op.,
Orrin W. Robertson,
G. D. Merrill,
E. J. McRavey.

When the action of the Milwaukee operators was sent to the Chicago office, the following dispatch was received in reply:

Chicago, January 4.

To A. Weller, Manager Milwaukee Office:

I congratulate you and your men for their good sense and the example that they have set. We have too many loyal men to be broken up. We are determined to carry this through to the bitter end, and will never submit to such dictation.

I am proud to say we are fully sustained by our men and the public generally.

J. J. S Wilson, Superintendent.

These men are branded by a publication which claims to be the mouth-piece of the craft as "cowards and traitors." Many are sorry to-day, that they did not obey their better judgment and do as they did. As a correspondent remarks, "these men concluded that no oath to do wrong could be registered in heaven, and therefore renounced it without scruple." Had this prompt renunciation been acted upon elsewhere, as soon as the baselessness of the movement was seen, it would have saved much unnecessary suffering. We owe them the duty of thus making their action public.

◆

The Land and Sea Telegraph Construction Company.

As intercourse increases between distant parts of the world, the natural desire is that it should be rapid. Hence the popularity of investments in telegraph companies, which supply the only means of providing for what has become, like railways, the greatest convenience in our social and commercial organization. Without referring to the existing means of supplying the telegraphic communication, we may call attention to the fact that another competitor is in the field, in the shape of the Land and Sea Telegraph Construction Co., a company which bases its claims on two plain principles, both of which are calculated to command acceptance. One is that, starting unfettered by incumbrances or unproductive capital, it can work so much the cheaper; and the other, which follows, that telegraphic communication may thus be extended to parts which, under higher charges, would be deprived of it. On these principles the company proposes to construct and maintain land and sea lines. Mr. George Fenwick's machines, which make a continuous cable without a splice, will be used in the manufacture, while Mr. Walter Hancock will carry out the works for the insulation of the conducting wires.—*London Money Market Review.*

The Panama and South Pacific Telegraph Company (Limited).

The trade of the South American Continent with this country is every year expanding, particularly with the States on the eastern coast, including Brazil and the Argentine Republic. It is also extending with the States on the western coast, including Ecuador, Peru, and Chili. The States on the western coast are a great deal further off from this country than those on the eastern; and, in fact, if we may reckon Venezuela to be one of them, the eastern States are almost as near to us as the southern West India Islands. Yet the general configuration of the continent is such that by the applications of electric science the whole of the long extent of western coast may be brought into instantaneous communication with this country. To appreciate the full weight of this remark our readers must be reminded that between Europe and the eastern coast of South America there is nothing but a wide extent of ocean, and that ocean the Atlantic. So that, though cables have been submerged between this country and North America, a similar enterprise between this country and Brazil, or even Venezuela, direct, though not impossible, would be a task sufficient to make men pause before venturing upon it. The eastern coast of that great southern continent must, therefore, if we would reach it telegraphically, be approached in some other way, so that shorter cables may be used; and, after all, a few hundred miles less or more makes no great difference, in the present advanced state of the practical science of telegraphy.

Fortunately nature has come into aid, so that both sides of the continent may be brought near to us, notwithstanding the vast seas that divide us from them. The narrow neck of land called the Isthmus of Panama supplies the means to this end. Several months ago we called attention to the West India and Panama Telegraph Company, whose lines are to be connected with that of the Cuba company, which, again, is connected with the whole of the North American system. This Panama project is rapidly progressing; and a reference to the map will show that by its means an opening is afforded to the whole line of the western coast of South America. It is at this point that a company just announced comes in. It is called the Panama and South Pacific Telegraph Company (limited). Uniting with the West India line at Panama, this company intends, by means of a land line of thirty miles and a submarine cable of 1,100 miles, to place the whole of Europe and North America in connection with Central America, the proposed cables being carried as far as Tumbez, an important port, interesting as the very place where the Spaniards first landed in Peru in the year 1525. There will, of course, be stations in the intermediate States of Ecuador and Peru, but it is from Tumbez that the company's wires will connect with those of the National Telegraph Company of Peru, and so on with the lines extending to the East, to the Argentine Republic and Brazil, up to their present terminus on the eastern coast, which is at Victoria, to the south of Rio. Working arrangements have been made with all the companies working these extensive connections. Excluding any connection with Brazil, nor taking into consideration the Atlantic trade of the Argentine Republic and New Granada, the company will meet the demands of an aggregate population of 12,000,000, and of a commerce of nearly £22,000,000 sterling per annum.

The lines of the Panama and South Pacific Telegraph Company become the essential link in this system. The capital proposed to be raised for this undertaking is £320,000, divided into £10 shares, and of this amount £60,000 is reserved for subscription in Peru. As regards the probable profits, reference may be made to the experience of the Cuba company, which is already earning upwards of £60,000 a year.

The cable and the land line will be made and laid by the India Rubber, Gutta Percha and Telegraph Works Company (limited)—the company which has laid the cables to be connected with this, and whose works for durability and efficiency are commended by all practical telegraphists.—*London Money Market Review.*

◆

The Panama and South Pacific Telegraph Company.

Incorporated under the Companies Acts, 1862 and 1867. Capital £320,000, in 32,000 shares of £10 each. Deposit on application £1 per share, and on allotment £1 10s. per share, and the remainder at intervals of two months, by installments of £2 10s. each. Part of the capital, to the extent of £60,000, is reserved by the concession from the Peruvian Government for subscription in Peru.

DIRECTORS.

Neil Bannatyne, Esq., London, late of Messrs. W. Graham & Co., Manchester, Director of the West India and Panama Telegraph Company.

Thomas Hughes, Esq., M. P., London.

Major-General William F. Smith, President of the International Ocean Telegraph Company, and Director of the West India and Panama Telegraph Company.

Frederick Pezet, Esq., of Lima, and Park-house, Twickenham-park.

Don Carlos Paz Soldan, Managing Director of the National Telegraph Company of Peru, Lima.

Alexander Ruden, Esq., of Messrs. Alsop & Co., Lima.

Alexander F. Low, Esq., late of Mexico, 84 Westbourne terrace, W.

(With power to add to their number).

Engineer—Sir Charles Bright.

PROSPECTUS.

This Company is formed for the purpose of extending telegraphic communication to the Western Coast of South America.

By the system of the West India and Panama Telegraph Company (now rapidly approaching completion) the whole of the continents of Europe and North America will be placed in connection with Central America, whence this Company will carry its lines to Tumbez, one of the principal ports in the north of Peru, touching at such intermediate stations in Ecuador and New Grenada as may be found desirable. This Company has obtained a valuable concession from the Peruvian Government, a copy of which, as published in *El Peruano*, the official gazette of Peru, of 16th November, 1869, can be seen at the offices of the solicitors of the Company.

From Tumbez this Company's lines will be connected with Lima and Callao and the other principal towns of Peru, with whom an exclusive arrangement for the interchange of traffic has been entered into, and who will hold a considerable interest in the capital of this Company.

The National Telegraph Company of Peru is the only undertaking of the kind in that country. It has a capital of £400,000, and has already established telegraphic communication between most of the chief towns of Peru. It is also rapidly pushing its lines southward towards Chili, which country will shortly be united with the telegraphic system of the Argentine Confederation, Uruguay, and Brazil, by lines now in course of construction between Valparaiso, St. Iago, Mendoza, Cordova, Rosario and Buenos Ayres. From Buenos Ayres a submarine cable is already in operation to Monte Video (paying 17 per cent. dividend), and the Brazilian Government has completed a land line from Rio Janeiro to Port Allegre, which will shortly be finished to Monte Video. Nearly all the most important towns and districts of South America will thus be brought into connection, this Company's lines acting as the main trunk line through which telegraphic communication will be effected with the continents of North America and Europe.

An exclusive and advantageous agreement for the interchange of traffic has also been entered into with the West India and Panama Telegraph Company, and a similar arrangement exists between that Company and the International Ocean Telegraph Company, connecting the United States with Cuba. This Company's lines will thus be worked in combination with the whole of the lines between the United States and South America, and as these Companies hold valuable exclusive concessions for a term of 40 years for laying cables between the Spanish West Indian Colonies and the United States, Central and South America, all competition will practically be excluded to the north as well as to the south of this Company's lines.

From an official statement drawn up by Don Mariano F. Paz Soldan, late Director-General of Public Works in Peru (now Minister of Justice), it appears that the Company's system (exclusive of any connection with Brazil) will supply the demands of an aggregate population of 12,000,000, and of a rapidly increasing commerce, amounting at present to £19,300,000 per annum, without taking into calculation the Atlantic trade of the Argentine Republic and New Granada.

Taking as a basis the actual results of the Cuba line (earning, after two years' working, at the rate of over £60,000 per annum), it is estimated that the gross revenue of this Company's lines will exceed		£100,000
From which deduct working expenses, say	£12,500	
Reserve fund	12,500	
		25,000
There will remain a net annual income of upwards of		£75,000

The lines, consisting of about 1,100 miles of submarine cable, and 30 miles of land line, will be of the best quality, and of the same class as the cables of the West India and Panama, and the International Ocean Companies, made by the India Rubber, Gutta Percha, and Telegraph Works Company (limited), with whom a contract has been entered into for the manufacture and laying of this Company's cables for the fixed sum of £300,000. The balance remaining, £20,000 will be amply sufficient for the erection of the land lines, stations, and all other expenses of completing the entire undertaking, until the Company is in receipt of revenue from traffic.

The lines will be completed in the course of the present year.

If no allotment is made, the deposit will be returned in full.

JANUARY, 1870.

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AN extraordinary general meeting of shareholders of the China Submarine Telegraph Company was held on January 7th, when resolutions were passed authorizing the directors to take the necessary steps for completing the line from Hong Kong to Shanghai, and for this purpose to increase the capital of the company by an additional issue of £300,000. Mr. Pender, the chairman, stated that other persons had contemplated supplying the want of telegraphic communication between the above ports, and that it was necessary to make immediate arrangements to prevent the loss of an important branch of the original scheme of the China Submarine Company.

EUROPEAN TELEGRAPH STATISTICS.

BY GEORGE B. PRESCOTT.

The following statistics are taken from the *Relazione Statistica sui Telegrafi del Regno d'Italia*, Florence, 1869; the *Rapport de l'Administration des Télégraphes sur Sa Gestion en* 1868, Berne, 1869; and the *Almanach de Gotha* for 1870:

TABLE I.

Countries.	*Year.*	*Receipts for Messages.*	*Expenses.* *Ordinary.*	*Expenses.* *Extraordinary.*	*Loss.*	*Profit.*
Austria and Hungary,.	1868	$1,390,195	$1,499,447	$476,949	$576,201	
Belgium,............	1868	239,420	252,017	21,288	33,885	
France,............	1868	2,013,763	1,932,391	651,189	569,817	
*North Germany,......	1868	1,682,895	1,768,365	168,502	253,972	
Italy,..............	1868	911,607	818,028	10,000		83,579
Spain,..............	1868	315,022	687,987		372,965	
Switzerland,.........	1868	184,236	169,965	41,800	27,529	
Sweden,............	1868	191,281	185,193			6,088
Norway,............	1867	111,134	111,589		455	
Russia,............	1868	2,280,341	1,759,397			520,944
		$9,319,894	$9,174,379	$1,369,728	$1,634,824	$610,611

Total expenses,.. $10,544,107
Total receipts,.. 9,319,894

Loss,.. $1,224,213

* North Germany includes Prussia, Lanenbourg, Saxony, Hesse, Mecklenburg-Schwerin, Saxe-Weimar, Mecklenburg-Strelitz, Oldenburg, Brunswick, Saxe-Meiningen, Saxe-Altenburg, Saxe-Cobourg-Gotha, Anhalt, Saxe-Rudolstadt, Saxe-Sonderstrausen, Waldeck, Rousse the Elder, Rousse the Younger, Schaumberg-Lippe, Lippe, Lubeck, Bremen and Hamburg.

TABLE II.

Countries.	*Year.*	*Messages Transmitted.*	*Receipts for Messages.*	*Expenses.*	*Receipts per Message.*	*Expense per Message.*
					U. S. Gold.	U. S. Gold.
Austria and Hungary,.	1868	2,593,893	$1,390,195	$1,966,396	$ 53	$ 75
Belgium,............	1868	1,053,230	239,420	273,205	22	25
France,............	1868	3,503,185	2,013,763	2,583,580	57	73
North Germany,......	1868	4,304,690	1,682,895	1,936,867	39	45
Italy,..............	1868	1,962,589	911,607	828,028	47	42
Spain,..............	1868	568,937	315,022	687,987	55	1 20
Switzerland,.........	1868	1,080,805	184,236	211,765	17	19
Sweden,............	1868	503,062	191,281	185,193	37	36
Norway,............	1867	309,604	111,134	111,580	35	36
Russia,............	1868	1,491,834	2,280,341	1,759,397	1 52	1 18
		17,372,039	$9,319,894	$10,544,107		

Avarage Receipts for Telegrams in Europe,..53 cents (U. S. Gold)
Average Cost of " " ....60 " "

TABLE III.

Countries.	*Year.*	*Area in Square Miles.*	*Number of Offices.*	*Square Miles per Office.*	*Tolls per Message for every 1,000 sq. miles.*	*Expense per Message for every 1,000 sq. miles.*
Austria and Hungary,.	1868	235,752	1,073	210	2 mills	3 mills
Belgium,............	1868	11,192	410	27	2 cents	2¼ cents
France,............	1868	206,359	1,701	121	2½ mills	3½ mills
North Germany,......	1868	157,671	1,969	84	2 "	3 "
Italy,..............	1868	108,008	1,065	101	4 "	3 9-10 "
Spain,..............	1868	189,909	184	1,032	3 "	6 "
Switzerland.........	1868	15,737	394	40	1 cent	1¼ cents
Sweden,............	1868	167,919	107	1,569	2 mills	2½ mills
Norway,............	1867	120,343	79	1,523	2 "	3 "
Russia,............	1868	2,054,985	382	5,380	7-10 "	5-10 "

TABLE IV.

Countries.	*Year.*	*Area in Square Miles.*	*Number of Miles of Line.*	*Number of Miles of Wire.*	*Proportion of Area to* *Line.*	*Proportion of Area to* *Wire.*
Austria and Hungary,.	1868	235,752	11,836	41,608	19	5
Belgium,............	1868	11,192	2,543	8,730	4	1¼
France,............	1868	206,359	27,228	89,086	7	2
North Germany,......	1868	157,671	14,677	47,946	10	3
Italy,..............	1868	108,008	9,911	29,283	19	3
Spain,..............	1868	189,909	6,916	15,610	27	12
Switzerland,.........	1868	15,737	2,662	6,438	6	2
Sweden,............	1868	167,919	2,103	2,801	79	59
Norway,............	1867	120,343	2,465	3,160	49	38
Russia,............	1868	2,054,985	24,840	48,360	82	40

TABLE V.

Countries.	*Population.*	*Number of Offices.*	*Number of Inhabitants per Office.*
Austria and Hungary,..............................	34,753,272	1073	32,390
Belgium,..............................	4,839,094	410	11,802
France,..............................	38,067,094	1701	22,380
North Germany,..............................	30,476,176	1969	15,477
Italy,..............................	24,270,809	1065	22,789
Spain,..............................	16,302,625	184	88,601
Switzerland,..............................	2,510,494	394	6,372
Sweden,..............................	4,173,080	107	39,000
Norway,..............................	1,701,756	79	21,541
Russia,..............................	68,390,000	382	178,769

The Telegraphers' Strike.

We close the history of this matter by the publication of documents received from Mr. Mumford, which he deems necessary for a perfect understanding of his course, and to a knowledge of the facts under which he acted. It is only necessary to read these statements to be, if possible, more thoroughly convinced of the utter groundlessness of the movement, and the mutinous spirit with which it was started. The strike has been a natural issue of the anonymous abuse of those in official position, the circulation of the meanest and most personal and vindictive diatribes against faithful men and the management of the Company week after week, encouraged and stimulated as these were by those who were safe from the operation of any injury which such an agency was sure to occasion.

* * *

Statement of James Gamble, General Superintendent Pacific Division, as to the Strike.

OFFICE OF THE WESTERN UNION TELEGRAPH CO.,
SAN FRANCISCO, Jan. 22, 1870.

On the 25th December last, I received a letter from District Superintendent Bell, dated Virginia, Nevada, December 24th, in which was the following item: "I think there is some plan among the operators either to strike for an increase of pay or resist a reduction. Do not know which. Hear a great deal of hints thrown out and private chats (over the line). Thought in case you knew nothing about it, would give you this hint, so you could be on your guard."

This was the first intimation given that the employees of the Pacific Division were in any way dissatisfied. Acting on the "hint," I soon found out that there was a plan on foot for a strike, in case certain demands were not complied with. A petition was to be presented in San Francisco, asking that a fixed schedule of rates be assented to after January 1st; in case the *request* was not complied with, it was to be demanded, and if refused there was to be a strike. If the demand was acceded to, the Sacramento and Virginia City operators were next to demand an increase, and so continue to all the principal offices of this division. It was also said, that the railroad operators had agreed to stand by them, and under no circumstances to fill a vacancy made by a striker.

After getting the above information, I called on Mr. Mumford and laid the whole matter before him. We at this time understood the strike to be a local one, confined to this Division. Under this impression, Mr. Mumford telegraphed at once to Mr. Palmer, stating what would be likely to occur, and asking if he could send operators in case of such emergency. All possible steps were taken to meet it promptly at every point here.

A course of action being fully determined upon, I left on the 30th December for Sacramento, to remain at that point until the matter came to a head. On the evening of the 31st, at Sacramento, when the night men came on to relieve the day operators, I called all together and told them I had been informed there was dissatisfaction among some of the operators, and if they had any grievances, to make them known, and I would do what I could consistently to remedy them. Each and all expressed themselves satisfied with their salary and position, but stated that it had been reported over the lines, that there was to be a general reduction of 20 per cent. in salaries. I assured them there was no such intention and no grounds for such a report; that on the contrary, I intended to increase the salary of one or two men in that office, who had accepted a position at less than the regular rate, taking the chances of an advance. Up to this time nothing had been said about a league of any kind. I told them that I understood that a strike for higher salaries was contemplated, and the demand was already made in San Francisco. They denied having any knowledge of such demand, but said they had agreed to resist a reduction. I told them no reduction was contemplated, but an increase was asked for which could not be entertained; that they had been misinformed in regard to the matter, and that there was an evident intention to mislead and force them to take a step they would all regret. I requested them to drop the matter and agree to go to work the next morning and continue through the month. They said they could not do this, unless so directed by their friends in San Francisco. I told them I did not see what the operators had to do with the matter; that they should be subject to my orders as Superintendent, and not to the operators in San Francisco; that I hoped that they would act upon their own good judgment and not that of others. I then learned for the first time, that they had taken an *oath* to stand by one another, and be subject to the will of *one man*. I then called for Mr. Mumford to come to the key at San Francisco, and communicated to him the state of affairs at Sacramento, when he telegraphed me as follows:

"James Gamble:—Tell the operators in Sacramento for me, that they are safe in leaving the question of justice or injustice to operators in other offices in the hands of the present management, where it belongs. They ought to know by this time, that there is no intention either on your part or mine, to act arbitrarily or unjustly towards any man; on the contrary, it gives me pleasure to increase a salary where the business justifies it. While I am always ready to meet any unwarrantable dictation, I don't believe in trying to make money by paying them less than their services are worth; at the same time as a business man, I can't increase the rate of compensation of this Company's employes, unless its finances are in a condition to justify it. GEO. H. MUMFORD."

"Add they have always been treated liberally and fairly as far as my knowledge extends, and there is no excuse or apology for an attempt to embarrass the business. G. H. MUMFORD."

After some further conversation over the line, a request was made by the operators that they should be allowed to send a delegation to inquire into S. F. matters. To this Mr. Mumford replied as follows:

"James Gamble:—No general increase of the amount we pay operators at present, can be acceded to. If any man at Sacramento has a just cause of complaint for unfairness towards himself individually, inquire into and redress it. If he then hesitates about going to work in good faith, dismiss him at once. Each one must mind his own business, and no leave of absence will be granted any one for the purpose of acting as delegate to San Francisco.

GEO. H. MUMFORD."

But the operators were not satisfied. They said they must be guided entirely by the San Francisco operators. This being the case, Mr. Mumford and myself agreed that the only course was to dismiss all that adhered to this resolution. They were given until ten o'clock that night to consider the matter (and not fifteen minutes as reported). At ten o'clock they withdrew in a body, leaving only the manager, chief operator and myself to do the business of the office.

The next morning the Virginia operators sent word that they would not go to work unless the two men discharged at San Francisco were reinstated. I told them the men were discharged for good cause, and that we could not comply with their demand; that I should regret very much to have them leave, but if they persisted in their demand, they might as well quit at once, as it could not be entertained.

They all left, including the chief operator, leaving only the manager and his clerk to do the business. Those who were left took hold with a will, and I am happy to say that not in any instance was there any delay in business in our principal offices. Some of the operators worked from sixteen to eighteen hours a day. Their zeal and fidelity were of the greatest value. And it was a most gratifying feature to the officers of the Company, that nearly all of their old employes stood firm and devoted.

As to Jacobs, he was inflated by his position, and desired to get all the notoriety he could out of it. He neither stands well with the Company nor his fellow operators. He left our service and went with the opposition line here, and remained with that Company until its decease.

At the earnest solicitation of the President of the opposition Company, he was taken back into the office here. Before he left our service the first time, he went into the operating room one night, quarreled with the operator on duty, and got soundly thrashed. He applied to me the next day to discharge the operator who had whipped him. After investigating the matter and finding him the aggressor, I declined to do it, and he left.

A year or two ago, I received a petition signed by all the operators in the Salt Lake office, requesting me to remove him from the overland wire; that owing to his ill-natured and disagreeable manner over the line, they were unwilling to work with him. Only a short time before the strike, he was sued for swindling a partner of his in a mining stock speculation, carried on while he was in the employ of the A. & P. Tel. Co., Mr. Jacobs being presumed to acquire information from seeing the Virginia City despatches.

His salary was attached, and Mr. Mumford then determined that he was not a fit person to hold a position in this Company, and that he should be discharged at the earliest opportunity.

As to the statements made in his letter of December 27th, they are all wilfully false, and so acknowledged by members of the League here, who say that he had no authority for making them, and did so entirely upon his own responsibility. I will take the statement that has the most appearance of truth, for an example. He says the salaries of operators in Virginia City and Sacramento were reduced $10 per month since the consolidation with the A. & P. Tel. Co.

On the first of February, a year ago, at the request of the operators and manager of the Virginia City and Sacramento offices, I dispensed with one operator in each office, and raised the salaries of the remainder ten dollars each, they agreeing to work extra hours. This plan saved the Company $40 in Virginia City, and $30 in Sacramento. The arrangement not working satisfactorily, the force was increased again, and the salaries restored to the former rates, thus increasing the amount paid by the Company to its operators. This was done *six months ago*. Well knowing these facts, Jacobs knew he was lying about them when he stated a reduction had been made. The salaries paid in those offices are no lower now than they were five years ago.

Stephen D. Field, and not Jacobs, was the chief operator of the San Francisco circuit of the League. He is not in the employ of this Company. For a long time he has been an assistant in the fire-alarm office in this city. He is not even a first-class operator. He knows nothing whatever, personally, of the facts, and his letters to the *Telegrapher* simply reiterate the garbled statements and falsehoods of excited strikers.

In conclusion, I would say that I believe this strike had so fully been determined upon that it was a moral impossibility to prevent it. Reductions had not been made, but any pretext answered the purpose. As one of the strikers remarked to me since, "if they had got the upper hand of us, we might as well have shut up shop."

Under similar circumstances, I should pursue the same course. While everything was done that was possible to prevent it and keep our good men in their places, nothing was left undone to ensure the total defeat of the conspirators who made the move.

JAS. GAMBLE,
Gen. Supt. Pacific Division.

STATEMENT OF J. W. BROWN, CHIEF OPERATOR.

OFFICE OF THE WESTERN UNION TELEGRAPH CO.,
SAN FRANCISCO, January 22, 1870.

I am the chief operator of the San Francisco office. I am acquainted with all the circumstances of the strike. I declare that in reply to a petition for increase of salary presented by some of the operators here, Mr. Mumford, on the thirty-first of December, gave me a written schedule of the salaries to be paid after the first of January. I certify that no salary in this office was reduced by that schedule; that wherever it changed salaries it gave the men more than they had ever been getting here before. I state that I posted that schedule for public information in the operating room, and that all this was done before there was a strike, or any appearance of it. I state of my personal knowledge that the discharge of Jacobs and Reese was the sole cause of the strike here—and that a reduction of salaries was a pretext. As far as my knowledge extends, no reduction of salaries was contemplated.

J. W. BROWN.

STATEMENT OF GEO. S. LADD, SECRETARY AND TREASURER.

OFFICE OF THE WESTERN UNION TELEGRAPH CO.,
SAN FRANCISCO, Jan 22, 1870.

"I am the Secretary and Treasurer of the California State Telegraph Company. I am also Chief Accountant of the Pacific Division of the Western Union Telegraph Company, and have charge of its books and general accounts.

I am notified of all changes in salaries at San Francisco, or elsewhere on the Pacific coast.

Vouchers in my possession, which I have this day verified, show that the salary of no operator or employe of any class, in San Francisco or Sacramento offices, was reduced during the months of October, November and December, 1869; nor have I been notified of any contemplated reduction, or had any reason to believe that a reduction was intended. The accounts and vouchers in my possession show that in Virginia City the following total amounts were paid by this company, to its operators in that office, during the three months ending December 31, 1869:

October, - - - - - - - - -	$613.36
November, - - - - - - - -	589.64
December, - - - - - - - - -	685.00

These facts prove that the allegations of the strikers, that salaries had actually been reduced, were wholly untrue, and I so declare them.

GEO. S. LADD."

STATEMENT OF FRANK JAYNES, CASHIER.

OFFICE OF THE WESTERN UNION TELEGRAPH CO.,
SAN FRANCISCO, Jan. 20, 1870.

"I am the Cashier of the Western Union Telegraph Company, in San Francisco. I state that Mr. Mumford informed me on the 31st of December, and previous to the strike, of the salaries that were to be paid in the operating department here, on and after January 1st.

I certify that such changes as were made in the payroll for December, in every instance, increased the compensation paid operators, and that no individual had his salary reduced. FRANK JAYNES."

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 6,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, FEBRUARY 15, 1870.

Telegraph Extensions.

During every year since the first returns were made to the treasurers of telegraph companies, the item of "construction" has loomed up as a kind of ghost, interfering with the comfortable size of dividends, and generally disturbing the holders of stock. "When is this construction account to be closed?" is a question on which we have expended more wise dodging to calm excited minds, and more eloquent glorification as to all which the building of new lines implied to the future of the company than we could perhaps quietly look at were these before us in a book. We wish now, however, to call attention to some interesting facts which are necessary to know in order to intelligently canvas the future and provide for it, and which thoughtful minds cannot help seeing are the inevitable results which are to attend our national development.

It is estimated that there have been invested in railroads in the United States about twenty-two hundred millions of dollars, and that these roads cover to-day about 50,000 miles of track. A large majority of the railroads of the country are annually adding to their property either by building lateral branches or by extending the main line. At the present time, according to the estimate of the *American Railway Times*, there are from twelve thousand to fifteen thousand miles of new railway under construction. Almost every State has its peculiar enterprises, and even in the older States where the whole surface of the country seems spidered over with webs of railroads, new ones are being built, air lines, or side lines, or extensions, as new conditions of society or the springing up of new interests demand their construction. Enlarged population, production, wealth, cry out on every side for means of transit, and no such demand now-a-days goes or can go unheeded. Let us see how this national wealth has increased, so that we may be able to predicate the extent of the enterprises contingent upon its enlargment.

In 1850 the value of the real and personal property of the country was $7,135,780,228. The census of 1860 showed $16,159,606,068, showing an increase in ten years of 126¼ per cent. It is believed that the estimates of 1860, being based on State assessments, were 25 per cent. lower than the true value, and that the property of the country should have been valued at twenty thousand millions of dollars. In the ordinary course of the national development of its wealth the real and personal property of the nation must show a valuation to-day of forty thousand millions of dollars. In 1850 there were 7,475 miles of railroad. In 1860 there were 27,771 miles, and now in 1870 there are at least 50,000 miles. During the past ten years also the population has increased nearly 35 per cent., and must now approximate 40,000,000. This population is spreading itself very largely in our new States, towns and cities springing up where a few years ago the foot of man never trod. These towns and cities scarcely take time to form a municipal government, or erect a town hall, before they demand a railroad and communication with all the world. It is the spirit of the times. Man will no longer consent to be isolated.

Let it be remembered also that the increase in population, and these interpenetrating tendencies of society are representative of other things. The increase of woolen, leather, iron and steel manufacture since 1860 has been enormous. Many undertakings which the war made necessary to provide for its exigencies, still continue to operate successfully for the demands of peace. Emigration has brought with it much skilled labor. Foreign capital has poured in to be engaged in promising enterprises. Our territory is immense, rich, exhaustless. Coal, iron and the precious metals are in abundance and wait for labor. To all these industries the railroad is a necessity. In ten years more it must be extended at least 25,000 miles beyond its present limits, and our population will, by that time, have increased to fifty millions.

What then? Only this. With every mile of rail there must go a mile of wire. The one is the contingent of the other. Indeed the wires must largely pioneer the rail, and the lightning reach the outlying settlement long before the snort of the iron horse is heard. This must form the basis of any truly national undertaking. It stands up clear, as imperative a necessity as the mail or the mill. So the construction account will not be closed. The Western Union Company would perish in a brace of years if it said "no!" to these ever growing wants. Its rivals are content to touch the large cities, uniting only points of present profit. To them this element of national provision does not come. But the Western Union Company have, by their policy, placed themselves as the distributors of popular communication. They cannot close their hand if they would. And thus it comes to be true that if 1880 is to see 75,000 miles of rail, it must see 90,000 miles of telegraph, and quarter of a million miles of wire. The vast extent of the national domain dwarfs even these figures. It is perhaps idle to speculate on the product of even so near a future. This much is certain, that the nineteenth century will keep its construction account open to its close, and year by year we shall see the spiders of the world spinning their webs from mountain to mountain and through all its seas and valleys, connecting every thinking brain and every laboring hand, until the telegraph wires are as numerous and as ganglionic as the nerves which articulate through the human frame.

The Telegraph in Great Britain.

Government assumed control of the British Telegraphic system February 1. According to all accounts "opening day" was as tumultuous as when the new spring dresses appear at Demarest's or Stewart's. There can be no doubt that governmental control is pleasing to the British national mind. All flocked to the telegraph stations the moment that V. R. appeared on the office blanks. It was a kind of loyal token to send some one a message. So the poor fellows who stood by the reception windows were overwhelmed with messages from Susan to her cousin, and from Bridget to Patrick McShay, as well as more courtly testimonials from Lady Honora to the Duchess of Bedford, and Capt. Valiant to the Duke of Buccleuch. Nay, the enthusiasm was so great that, if accounts by cable are to be believed, the wires leading to the west coast and to the Emerald Isle were all cut off, until something like composure had settled down upon the British heart and nation.

Since then telegraphic matters have proceeded with due regularity, under the control of the electricians so well known under their former administration. We do not doubt the ability with which the Government telegraph will be managed, and no field could be more favorable for its demonstration. The whole area of Great Britain does not much exceed that of the States of New York and Pennsylvania, New York and England having an almost similar configuration and number of square miles. Such a limited territory, so densely populated, so interlaced with old established roads, presents the finest possible field for the display of executive ability and economical telegraphic communication. Added to this let the cheapness of labor be considered; operators paid fourteen shillings a week, or $200 per annum, and messengers for a mere nothing, with thousands anxious for employment, and it is evident enough that the field is eminently favorable to the scheme, and in utter contrast with the conditions as found in the United States.

Although we trust that the telegraph in the United States will be left untouched by Government hands, deeming it in the highest degree impolitic and repulsive to our national instincts, yet we are conscious of a sentiment gaining strength among certain classes of men, that the experiment ought to be tried. Perhaps it may prove that such an experience is needed to convince the public of its impolicy and impracticability, in order to place the American telegraphic system into final administration under the only true stimulus of private enterprise.

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FRENCH TELEGRAPH MONEY ORDERS.—The French Council of Ministers have adopted a proposed plan of money orders by telegraph. The maximum for a single order is fixed at 5,000fr. (£200). The dispatches are to be charged at the same rates as ordinary telegraphic messages, and the charge for the order is to be 2 per cent., or twice the rate charged by the Post Office.

◆

THE telegraph lines are nearly completed between Tampico and Vera Cruz. The lines will be extended to Matamoras, thus placing Mexico in telegraphic communication with the United States.

The Panama and South Pacific Telegraph Co.

We direct attention to the telegraph movements in South America, which will be found elsewhere, by which promise of an early connection with our southern Republics is so emphatically given. It cannot be long before not only the West India Islands, but the whole eastern and western coasts of South America will be telegraphically connected with the United States by way of Cuba. The directorship of this magnificent system of lines is duly divided between the United States, South America and England, General W. F. Smith, President of the International Ocean Telegraph Company, representing North American interests. In these enterprises Panama must soon become a focal point. The cable from Panama South to Tumbez, Peru, now making will be 1,100 miles in length, and will connect with the lines of the National Telegraph Company of Peru on the one hand, and the West India and Panama Telegraph Company on the other.

◆

Cyrus W. Field, Esq., left Southampton, England, for New York, on the Main, February 8th, having been entirely successful in the object of his journey. Shortly after his return he designs, we are informed, to accompany Edward Lyulph Stanley, brother of Lord Stanley, on a tour to Siam via San Francisco, Japan and China.

◆

Check Errors.

We have been shown a number of letters sent to the error-check department of which no use can be made because of the obscurity of the dates they bear. An office in Siberia having a signal S for its call, the manager seems to think that signal must be familiar the world over, and to find him the letter S is only needed to be placed on an envelope and mailed him. So he signs his letter to the error-check department "S offs" or "Ph ofs," and these signals not being known it finds its way to the waste basket. Dozens come so monthly. These signals become familiar to operators on certain circuits, but every communication by mail to any officer in any department ought to bear at least the full name of the office and State from whence it came.

◆

Messages of Enquiry.

To aid in the examination of the delivery of messages and obtaining answers, especially when the enquiry or request is made of large offices such as New York, Philadelphia, Boston, Chicago, St. Louis, &c., the name of the person or firm from whom answer is desired ought always to be *stated in full*. When this is not done it leaves uncertainty as to the identity of the message, and causes much loss of time. Will managers take note of this?

◆

Another cable to connect Wales and Rhode Island is proposed.

◆

The Indo-European Telegraph Company have completed their line from London to India.

◆

There seems to have been great and frequent interruption to telegraphic communication in England since the government took possession.

OFFICIAL STATEMENT.

Western Union Telegraph Company.

	Dec. 1869.	Dec. 1868
Total Receipts..........	$597,063 55	$634,630 11
Total Expenses	425,582 20	398,342 96
Net Profits..........	$171,481 35	$236,287 15

◆

Atlantic Cable Business.

CHANGE OF TARIFF TO INDIA, CEYLON AND CHINA.

We are advised of following changes of tariff, to take effect February 15th, 1870 :

From London to			
India	10	Words....	$ 9 25
"	20	"	14 25
Ceylon and Farther India..........	10	"	10 25
" " " "	20	"	15 25
China, Post Galle, including postage..	10	"	10 50
" " " " ..	20	"	15 50

Every additional ten words or fraction of ten words beyond twenty, to be charged one-half of the twenty-word rate.

Cuba Cable Business.

Rule Four is amended by the Cuba Company as follows :

Code or cypher messages and abbreviations are disallowed by the Spanish Government without special permission. When such special permission is obtained, they will be sent subject to the following regulations :

Code Messages—by which are meant messages constructed for purposes of secrecy, of disjointed sentences or words rendering the meaning unintelligible—will be transmitted with every possible care ; but the Company while willing to investigate by post complaints respecting errors in such messages, will not return the charges upon them unless they be "repeated messages." (See Rule 6.) Should the receiver of such a message have it repeated, the amount paid for application and reply will not be returned unless the message was originally a "repeated message" and paid for as such by the sender.

Cypher Messages—by which are meant messages consisting of letters, grouped or otherwise, not forming any known or dictionary words, or of numerals—will be counted each letter or figure as a word. When cypher is intermixed with plain words, the plain part of the message will be charged at ordinary rates, and the remainder as cypher.

◆

Mr. Craig's Letter.

In the New York *Herald* Mr. Craig publishes a characteristic reply to our article on the automatic telegraph, which we read with the pleasure which all spicy things inspire, and which is always characteristic of his pen.

In classifying the "Little" machinery with other automatic systems, we attempted no disparagement of any except as to the range of labor they necessarily involve. Mr. Craig cannot convince us or any body else that it is easier or simpler to manipulate any mechanism by which a compound letter is formed than the depression of the House key. Yet the touch of the one records a Roman letter at its destination, while the other only prepares it to be sent. We claim a vast difference in these processes. Nor do we design to say that such a mode of transmission as Mr. Craig so praises is valueless. There are times when, by the accumulation of business, it could be utilized to advantage. This is its only use in England or the continent. It is an aid valuable only as such. As a system, we believe it defective and unsuited to general use. It should be the aim of invention to simplify labor, not to multiply its processes and peril its results.

TARIFF BUREAU.

Semi-Monthly Circular.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
February 15, 1870.

To all Offices on W. U. Lines :

The following changes in tariff have occurred since February 1, the date of the last tariff order. Please note them in your tariff book :

NEW OFFICES.

485 Allen's Pen, Tex.
263 Ashby's, Ind.
164 Batesville, S. C.
65 Blodgett's Mills, N. Y.
196 Camak, Ga., re-opened.
* Central Square, N. Y.
* Cleveland, N. Y.
* Constantia, N. Y.
106 Drake's Branch, Va., re-opened.
* Eaton, N. Y.
Fairville, N. B., tariff same as St. John, N. B.
308 Forrest, Ill.
* Hackensack, N. J.
* McConnellsville, O., formerly W. U. office.
* Morrisville, N. Y.
* Munnsville, N. Y.
Muscotah, Ks., 15c. more than Achison, Ks.
Netawaka, Ks., 20c. more than Atchison, Ks.
* North Bay, N. Y.
* Oneida Community, N. Y.
130 Paxton House, Pa.
* Pennellville, N. Y.
* Peru, N. Y.
185 Pine House, S. C.
333 Shubuta, Miss.
* Smith's Valley, N. Y.
* Smyrna, N. Y.
184 Thomasville, N. C.
328 Tamaroa, Ill., re-opened.
308 Urbana, Champaigne Co., Ill.
340 Wythe, Tenn.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.	*Leaves this Line.*
Hackensack, N. J..........	same as	Paterson, N. J.
McConnellsville, O..........	35 2	Zanesville, O.
Braeside, Ont..............	same as	Pembroke, Ont.
Castleton, Ont	"	Lindsay, Ont.
Drummondville, Ont.......	"	Davenport, Ont.
Moore's Station, Que.......	"	Magog, Que.
Mohr's Corners, Ont.......	"	Pembroke, Ont.
Newry, Ont................	"	Newbury, Ont.
Peru, N. Y	"	Plattsburg, N. Y.

Business for the following offices may be sent via Oswego or Oneida, whichever may be the cheaper route :

	25 2	Oswego, N. Y.	
Central Square, N. Y.......	25 2		Oneida, N. Y.
	25 2	"	
Cleveland, N. Y............	25 2		"
	25 2	"	
Constantia, N. Y...........	25 2		
	35 2	"	
Eaton, N. Y................	25 2		
	35 2	"	
Morrisville, N. Y...........	25 2		
	30 2	"	
Munnsville, N. Y...........	25 2		"
	25 2	"	
North Bay, N. Y............	25 2		"
	30 2	"	
Oneida Community, N. Y...	15 1		"
	25 2	"	
Pennellville, N. Y..........	25 2		"
	40 3	"	
Smith's Valley, N. Y........	25 2		"
	40 3	"	
Smyrna, N. Y...............	25 2		"

OFFICES CLOSED.

Cedar Grove, Ind. ; Woodbine, Iowa ; Camp Creek, Iowa, and Loda, Ill.

William Orton, President.

John A. Wright, of Trenton, N. J., writes, asking information of the financial condition of the Telegraphers' Mutual Life Insurance Association. He also suggests making an assessment of ten or twenty-five cents on each member, to pay for the publication of its financial condition in other papers.

In reply to this, which he says comes from other parties as well as himself, it may be said, that the executive committee do not feel at liberty to incur one dollar's unnecessary expense, or to make any assessment which can be avoided. When a death occurs, every dollar on hand, except the fifty cents which accompanies the application for admission to membership, and a deduction of just enough to meet the cost of printing and posting the circular announcing a new assessment, is paid to the heirs o the deceased; thus, to Milton B. Graham's widow there has been remitted $592; postages and circulars, $20, leaving in the treasury about $145 from fees. This is the whole statement, and as The Journal of the Telegraph goes to every Western Union office, and all announcements are made free, we see no need of greater publicity, as the paper is accessible to whoever desires to see it. To avoid all complaint, however, we will hereafter print in the assessment circulars the actual condition of the association, so that all may know.

Had the practice now adopted, of deducting the cost of circulars and postage from the payment to heirs, been adopted from the first, there would have been about $300 in the treasury for expenses; 720 certificates having been issued yielding $360; $60 of which have been spent for books, certificates and other necessary things, and which has been the total expense of conducting the association for the last two and a quarter years. Unless drawn into expenses not by us deemed necessary, there need never be occasion for any assessment on any member beyond the one dollar on the occasion of a death.

◆

Telegraphers' Mutual Life Insurance Association.

ASSESSMENT NO. 11.

W. C. Havens,
L. O. Bliss,
Charles A. Schuster,
Colin Fox,
John C. Sullivan,
L. B. Dwight,
John Beamer,
John C. G. Hawley,
W. H. Stanton,
C. Corbett,
C. A. Thomas,
William Ferguson,
Joseph Beach,
William Patterson,
William Macintosh,
A. F. Swan,
H. F. Makepace,
F. C. Ward,
W. H. Fessenden,
Thomas H. O'Reilly,
Carrie A. Hinds.
Henrietta Dieckman,
Andrew Smith,
A. B. Chandler,
D. R. Downer,
C. E. Cockey,
Geo. E. Spencer,
T. P. Scully,
J. B. Tree,
J. E. Selden,
M. C. Houseman,
O. M. Gay,
H. L. Gramsow,
W. H. Hoyt,
E. B. Clarke,
James E. Moon,
John A. Wright,
Mary E. Bell,
D. Easterlin,
Geo. W. Bell,
Samuel Ward,
W. J. Denver,
Henry Denver,
J. Merrihew,
A. P. Eastlake,
Wm. Corley,
Elisha Rider,
S. Lawrence,
Fred. Fairchild,
H. W. Wynkoop,
Geo. J. Whitehead,
Geo. H. Grace,
Fred. J. Grace,
J. M. Foster,
W. C. Long,
Wm. Connor,
D. L. Findlay,
A. H. Kanode,
R. H. Morris,
Geo. W. Baldwin,
D. A. Van Ham,
J. K. Calvert,
Joseph Knittle,
William Cook,
Mattie L. Smith,
J. P. Kirchner,
Lizzie H. Snow,
E. L. Catterfield,
Geo. F. Durant,
A. A. Durant,
J. H. Emerick,
Wm. J. Bodell,
Wm. J. Dealey,
John Horn, Jr.,
Horace C. Fardon,
Gerrit Smith,
R. B. Lown,
L. E. Atwater,
Thomas R. Fox,
Robert Wilkinson,
Park Fitchelt,
Annie E. Myers,
S. K. Bapley,
B. Cunningham,
M. S. Roberts,
Geo. W. Roberts,
W. H. Hill,
J. Mitchell,
A. G. Bates,
N. H. Rugg,
R. L. Guion,
D. P. Livermore,
W. W. Shock,
H. M. Early,
J. Feary,
Jonas S. Brown,
A. R. Brewer,
James Miller,
Walter Miller,
Benj. Clark,
W. D. Sargeant,
Isaac Van Dusen,
Leonard Reid,
W. G. Jamieson,
R. S. Raymond,
J. H. Purnell,
John Coyne,
George Muttart,
Levi G. Bliss,
O. A. Horne,
R. R. Gifford,
A. B. Waite,
D. Leary,
E. Powell,
A. J. Schall,
E. N. Taylor,
J. O. Kelly,
D. V. Ferris,
D. L. Pike,
J. D. Stone,
Charles L. Chase,
Ellis Stone,
N. B. Topping,
S. A. Jessup,
J. P. Cassidy,
H. H. Henry,
J. A. Swift,
A. S. Howe,
C. H. Welch,
L. A. Louis,
Geo. E. Spellman,
J. B. Louis,
L. C. Parsons,
John Hatch,
B. H. Woodward,
John F. Myers,
S. L. Gilson,
C. O. Rowe,
John B. Page,
J. C. Christie,
S. H. Edwards,
Emma Sammis,
A. K. Ingraham,
Geo. A. Brown,
J. A. Brenner,
J. M. Crowley,
M. L. Ruthrauff,
Henry Griffith,
J. C. Bignon,
C. H. Stancliffe,
Wm. H. Booth,
J. M. Fairchild,
Z. Hubbard,
B. D. Hubbard,
D. B. Case,
J. W. Tillinghast,
Thomas Henning,
James Cooper,
T. A. Laird,
A. Stuart Brown,
O. H. Lincoln,
Wm. K. Applebaugh,
A. Neilson,
G. S. Shepard,
H. A. Cluts,
A. G. Fox,
C. E. Case,
T. S. Procter,
Edward P. Ely,
John Fuller,
C. A. Lebb,
A. M. Young,
Tom. A. Graham,
P. Collins,
R. W. Marriott,
S. M. Hunter,
J. Babcock,
Geo. W. Dyer,
J. A. McGee,
A. H. Patterson,
C. H. Wolcott,
S. S. Thompson,
D. T. Francis,
James P. Golden,
M. O. Morgan,
C. F. Segelken,
Calvin T. Sellers,
Geo. W. Moore,
J. Fottrell,
A. K. Burroughs,

◆

Born.

January 30, at Dixon, Ill., the wife of Geo. C. Parkins, Manager Western Union Telegraph Office, of a son, 10¼ pounds.

January 28, to P. W. Hammond, Manager Western Union Telegraph Office, Boonton, N. J., a daughter.

February 5, to A. L. Sweeman, of the Western Union Telegraph Office, Providence, R. I., a son.

◆

Married.

Tuesday, February 8, at Weathersfield, Ill., by Rev. R. B. Guild, Fred. E. Grubb, Manager Western Union Telegraph Office, Galva, Ill., to Miss Ada L. Clapp, of Weathersfield.

December 31, 1869, at Brooklyn, Iowa, A. R. Chapman, Manager Western Union Telegraph Office, Grinnell, Iowa, to Miss Flora Overman, of Brooklyn, Iowa.

◆

Died.

In Philadelphia, on the 5th instant, James Carley, Receiving Clerk, Western Union Telegraph Company, of pulmonary consumption.

The Magnetic Telegraph.

Along the smooth and slender wires
  The sleepless heralds run,
Fast as the clear and living rays
  Go streaming from the sun;
No peals or flashes heard or seen
  Their wondrous flight betray,
And yet their words are plainly felt
  In cities far away.

No summer's heat or winter's cold
  Can check their rapid course,
They meet, unmoved, the fierce wind's rage,
  The rough wave's sweeping force;
In the long night of rain and wrath,
  As in the blaze of day,
They rush with news of weal or woe,
  To thousands far away.

But faster still than tidings borne
  On that electric cord,
Rise the pure thoughts of him who loves
  The Christian's Life and Lord;
Of Him who taught in smiles and tears,
  With fervent lips to pray,
Maintains high converse here on earth
  With bright worlds far away.

Ah! though no outward wish is breathed,
  No outward answer given,
The sighing of that humble heart
  Is known and felt in heaven.
Those long frail wires may bend or break,
  Those viewless heralds stray,
But faith's least word shall reach the throne
  Of God, though far away.

◆

Faure's Voltaic Battery.

Engineering gives in its last issue the following description of a new form of voltaic cell, lately designed by Mr. C. Faure, of 6 Robert Street, Adelphi, which appears to well deserve the attention of electricians: "This battery consists of an outer jar, containing a solution of common salt (chloride of sodium), there being immersed in this solution the zinc cylinder or positive element. Within this zinc cylinder and separated from it by an india rubber ring, is a porous jar or bottle; this jar, which is made of graphite, and which forms the negative element, containing nitric acid. The mouth of the jar is closed by a gutta percha stopper, and thus, as the binoxyde of nitrogen is liberated from the nitric acid, it accumulates in the bottle, creating a certain pressure, and forcing the nitric acid through the walls of the jar. By this arrangement the escape of the nitrous acid vapor into the air is avoided, and the constant depolarization of the couple is effected by the continuous exosmosis of the nitric acid from the bottle containing it.

Mr. Faure states that his battery gives twice the quantity of electricity of a Grove or Bunsen battery of the same dimensions, and that it also works much longer with the same charge of acid. Mr. Faure's battery also possesses greater constancy and electromotive force than the nitric acid batteries now in use; and by fitting it with a syphon arrangement for maintaining the supply of nitric acid under pressure, and providing for the removal of the exhausted solution of salt, it may be worked for long periods together. For short experiments, on the other hand, the porous bottle may be filled with coarse, silicious sand, to reduce the charge of acid. In conclusion we may state that one of these batteries, rated by Mr. Faure as "No. 4," and having a porous jar 2¾in. in diameter by 5in. high, will keep ¾in. of fine platinum wire red hot for from twelve to fifteen hours."

Journal of the Telegraph.

Presentation.

Mr. T. J. Waugh, late Superintendent of the Telegraph Department, G. W. R., was presented with a handsome gold watch and chain (accompanied by an address), by the operators of the Department. London being at present the headquarters of this department, the proceedings took place there, and a large number of operators were present, Mr. Showerman, the present Superintendent, kindly granted permission to all who could make it convenient to attend. The address was accompanied by the presentation of a very handsome gold watch and chain, with the following inscription beautifully engraved: "Presented to T. J. Waugh, Esq., by the telegraph operators connected with the Great Western Railway, January, 1870." The whole affair was of the most interesting nature, and Mr. Waugh has reason to feel proud of this spontaneous mark of respect on the part of those whom his uniform kindness and urbanity have strongly attached to him. The following is the address:

LONDON, Ont., January 31, 1870.

T. J. WAUGH, Esq.

Dear Sir: The operators connected with the Telegraph Department of the Great Western Railway deeply regret to learn that you have retired from the company's service; and in view of the mutual good feeling and pleasant relations that have always characterized our intercourse with you, and the praiseworthy interest you have always manifested in our welfare during the six years you have filled the important position of Telegraph Superintendent, we feel that we cannot allow you to part from us without giving expression to the feelings of respect and esteem we entertain for you.

Under your management, Sir, many important improvements have been effected, and the efficiency of this department greatly increased in every respect, which gives us confidence, in parting with you now, that the same energy and ability you have on all occasions heretofore displayed will enable you to attain, and efficiently to fill, positions even better than the one you now resign. Accept, dear sir, of this testimonial as a slight indication of our regard for, and continued interest in, you; and as you will long live in our memories, we, in saying good bye, respectfully request an abiding place in yours.

Signed on behalf of the committee,

JAS. BLAIR, Secretary.

MR. WAUGH'S REPLY.

GENTLEMEN: Allow me to thank you for this handsome testimonial, it being but another mark of your esteem in a form more substantial than words, illustrating that good feeling which has ever existed between the operators of the Great Western Railway Company and myself. It matters not where my lot in life is cast, this beautiful memento of your good wishes will ever accompany me, and as it records the fleeting moments of the future, may it never note one that will cause me to forget the many warm friends I leave behind connected with the Great Western Telegraph Department.

T. J. WAUGH.

◆

A Present Well Bestowed.

If there is a competent and obliging official, as well as a true-hearted gentleman, upon the face of the earth, that man is H. N. Rowell, of the Western Union Telegraph. But it seems that his connection with his subordinates has been fully as agreeable in its nature as his relations to the press and public; and no better evidence of the fact can be presented than a pleasant incident that transpired on the evening of the 5th. It seems that for some time past the operatives on certain portions of "Hod's" beat have been, in a measure, conspiring against him, not in the way of a strike, but in a most unexceptionable manner. On Saturday evening the conspiracy culminated by the employes of the Concord office going in a body to Mr. Rowell's house. After a while the Superintendent was cornered, and Mr. Frank Eastman fired a speech at him, which, in telegraphic phrases, embodied most gratifying compliments. The speaker concluded by presenting to Mr. R. a splendid watch and chain, such as any man might be well pleased to sport. Mr. R., being naturally a bashful man, was scarcely able to stammer his thanks, and responded formally by proxy.

On the cap of the watch was inscribed, "presented to H. N. R., by his operatives on 3, 4 and 5 north, Feb. 5, 1870." Two telegraph poles are also engraved on the cap, with a connecting wire, in the centre of which is a closed hand, grasping lightning. The whole outfit is substantial as well as sightly.—*Concord N. H. Daily Patriot.*

◆

A Prosperous Telegrapher.

BRASHEAR CITY, LA.

During the past week several transfers of property have been made in this place. Mr. Ed. C. McLellan, formerly of Belfast, Maine, where he entered into the telegraph service under Superintendent Bedlow, in 1858, has purchased for $2,500, the Henning property, situated near the railroad in the east part of town, being among the largest and most desirable residences here. Mc. has been in the employ of the Western Union Telegraph Company for over four years, connected the wire with Texas, and sent the first dispatch over that line. The company must appreciate his services, for he is certainly attentive, polite, and obliging to all transacting business in his office.—*Attackapas Register.*

In a letter from Mr. McLellan, he says: "For the information of the fraternity in New England, I can say that the re-setting of poles in a Louisiana swamp during the month of August, is fully equal to clearing wire during January in New England after a severe storm. Especially is it so when we are compelled (which we sometimes are) to wipe out several rattlesnake and alligator nests before finding good bottom."

SPECIAL NOTICE.

GRAY & BARTON,

(Manufacturers for the American Private Line Telegraph Company.)

Beg leave to announce that they have removed their Chicago works from 162 South Water Street to

No. 13 LaSALLE STREET,

And have added thereto a large amount of new Machinery and Tools, especially adapted to the manufacture of all

TELEGRAPH AND ELECTRICAL INSTRUMENTS.

They are prepared to supply orders for

MACHINERY OR TELEGRAPH SUPPLIES

of all kinds and descriptions at brief notice.

Our machinery will be of the latest and most approved designs, and special advantages have been secured for furnishing instruments of the patterns of the Caton and Western Union Shops, the high reputation of which will not suffer at our hands.

We call the attention of all interested in the working of Telegraph Lines to the fact that we make first-class RELAYS with a resistance of only from six to twelve miles, and make no Main Line Magnets with high resistance except to order.

Hereafter all our Relays will have the resistance of each instrument accurately measured and marked on the base.

FRANK L. POPE,
TELEGRAPHIC AND ELECTRICAL ENGINEER,
Nos. 78 and 80 Broadway, Room 48,
NEW YORK.

AMERICAN FIRE ALARM
AND
POLICE TELEGRAPH.
GAMEWELL & CO., PROPRIETORS,
NO. 104 CENTRE STREET, NEW YORK.

This system of Fire Alarm Telegraph, with a central office, or upon the

AUTOMATIC PLAN,

is now in operation in the following cities, to which reference is made for evidence of its great SUPERIORITY AND VALUE, and UNIFORM reliability:

BOSTON,
CHICAGO,
PHILADELPHIA,
CINCINNATI,
ST. LOUIS,
BUFFALO,
BALTIMORE,
MOBILE,
NEW ORLEANS,
PITTSBURG,
LOUISVILLE,
ALLEGHENY,
MONTREAL,
QUEBEC,
PORTLAND,
ST. JOHN, N. B.,
HARTFORD,
TROY,
NEW HAVEN,
ROCHESTER,
SPRINGFIELD,
TOLEDO,
ALBANY,
COLUMBUS,
LAWRENCE,
MILWAUKEE,
SAN FRANCISCO,
CAMBRIDGE,
WASHINGTON, D. C.

The distinctive features of
THE AMERICAN FIRE ALARM TELEGRAPH
are a Combination of Circuits, the Automatic Signal Boxes, Electro-Mechanical Bell and Gong Strikers.

THE AMERICAN FIRE ALARM AND POLICE TELEGRAPH is covered by some twenty patents. Very early after its introduction into Boston, GAMEWELL & Co. purchased the original patents of FARMER & CHANNING, and during the past fifteen years have spared no expense or pains to improve and perfect this system.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

THE STANDARD
AMERICAN WORK ON THE TELEGRAPH.
MODERN PRACTICE
OF THE
ELECTRIC TELEGRAPH.
A HAND-BOOK FOR ELECTRICIANS AND OPERATORS.
BY FRANK L. POPE.
1 Vol., 8vo. Profusely Illustrated.
WHAT LEADING ELECTRICIANS AND TELEGRAPHERS SAY OF IT.

"Your illustrative diagrams are admirable, and beautifully executed. * * * *

"I think all your instructions in the use of the telegraph apparatus judicious and correct, and I most cordially wish you success."—Prof. S. F. B. MORSE.

"There is no other work of this kind in the English language that contains in so small a compass, so much practical information in the application of galvanic electricity to telegraphy."—Prof. G. W. HOUGH, Director of Dudley Observatory.

"I have read the book carefully through and have been both interested and instructed by it. It is just the sort of book that was wanted in America—clear and to the purpose."—ROBERT SABINE.

"I feel assured that it will prove of great value to all interested in the science or practical details of the Electric Telegraph, and supply a deficiency that has long existed."—Gen. ANSON STAGER.

WHAT THE PRESS SAYS OF IT.

"There was a felt necessity for just such a work as Mr. Pope has given us. * * * There are portions of the work which no operator can afford to be without."—*The Telegrapher.*

"From a careful perusal of this work we are assured that it supplies a long felt want. * * * It will tend much to improve the knowledge of electricity and practical telegraphy amongst the operators."—*London Mechanics' Magazine.*

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VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

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XVI. The books of the association shall always be open for examination by any member thereof.

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◆

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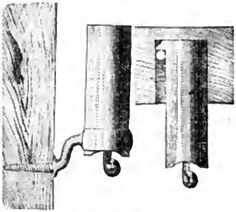

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John Polhemus, Printer and Stationer, 102 Nassau Street, N. Y.

JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 7. NEW YORK, MARCH 1, 1870. WHOLE NO. 56.

Faraday's Immense Industry.

Faraday had for many years kept a common-place book. In 1822 he commenced a new and more detail note-book, which he called "Chemical Notes, Hints, Suggestions, and Objects of Pursuit." In this we find mention of many researches, which were elaborated and published at a later date. For instance:

"General effects of compression, either in condensing gases or producing solutions, or even giving combinations at low temperatures. . . .

"State of electricity in the interior and on the surface of conductors, and on the surface of holes through them.

"Transparency of metals. Sun's light through gold-leaf. Two gold leaves made poles—light passed through one to the other."

At a later date, he wrote at the commencement of this collection of notes: "I already owe much to these notes, and think such a collection worth the making by every scientific man. I am sure none would think the trouble lost after a year's experience."

In 1823, Faraday was elected a Fellow of the Royal Society; and other scientific honors now began to be offered him. He received, altogether, ninety-five honorary titles, and of these he said: "One title—namely, that of F. R. S.—was sought and paid for; all the rest were spontaneous offerings of kindness and good will from the bodies named."

In 1825, on the recommendation of Sir H. Davy, Faraday was appointed Director of the Laboratory of the Royal Institution, and one of his first acts was to invite members of the Institution to attend evening meetings in the Laboratory, at which Faraday showed new and striking ex[illegible]iments. From these meetings sprang the Friday evening discourses so well known to all of us, and the establishment of which probably, remarks Dr. Bence Jones, "saved the Institution."

As early as 1839, the last year of Faraday's higher scientific education, his researches numbered more than fifteen thousand paragraphs, and was concluded in 1856.

He had already made notable researches on electro-magnetic motions, on the condensation of gases, on the manufacture of glass for optic purposes, and on the alloys of steel. He had discovered two chlorides of carbon, benzol and sulpho-naphthalic acid; and he had made various experiments on the diffusion of gases. Moreover, he had published sixty scientific papers, nine of which were in the *Philosophical Transactions*. Here, then, for the present, we will leave him, in his thirty-ninth year.—*Chemical News.*

◆

MR. CORBETT, from the Committee on Commerce, to whom was referred the bill (S. No. 117) to encourage and facilitate telegraphic communication between the eastern and western continents, reported it without amendment.

Restoring the Voice by Electricity.

Every one has often heard of singers "electrifying" their audience. It appears that to do this with proper effect they ought first to be electrified themselves. Dr. Poggioli, the physician attached to the Theatre Italien, has addressed a letter to M. Bazier, director of that establishment, in which he says that for fatigue, hoarseness, sore throat, and other ailments from which vocalists so often suffer, there is no remedy comparable to electricity. Five pupils of the Conservatoire came to him, it seems, the other day, to be treated, three for hoarseness and loss of voice, two for some malady affecting the larynx. He electrified them, and all were cured. That there might be no mistake as to the efficacy of the electrifying process, Dr. Poggioli made his patients sing before subjecting them to it, and again immediately afterwards. The difference, he says, was marvelous. After being electrified "their respiration was better and deeper, their voices stronger, fuller, and more pure." Two of the pupils belonged to Delle-Sedie's class; and Delle-Sedie was so satisfied with Dr. Poggioli's results that he caused himself to be electrified the other night when, being called upon to play the part of Rigoletto, he found himself too hoarse to make the attempt. Electricity, however, soon set him to rights, and he went through the difficult part not only successfully but triumphantly. Dr. Poggioli says he could mention several singers who have lately obtained "unexpected success" through the stimulating effects of electricity; and we could ourselves furnish Dr. Poggioli with the names of several singers to whom the application of a little electricity would certainly do no harm.

Whether he had been over electrified or not does not appear; but soon after his performance of the part of Rigoletto, Delle-Sedie lost his temper, quarreled with M. Bagier, and has now broken his engagement.

◆

Treatise on the Leclenche Bettery:

Preceded by a few Remarks on the Employment of Electrical Batteries in Telegraphy.

In this pamphlet will be found a full description of the Leclanche cell, the main feature of which is that peroxide of manganese is used with zinc (amalgamated) and an aqueous solution of alkaline salt, chloride of ammonium being preferred. The author states, and his statement is borne out by comparative experiments made with the Marie-Davy, Daniell, and Bunsen cells, that the Leclanche cell is preferable to any other. The cells are of three sizes; the smallest, with a porous pot 4.3 inches high, can accomplish an annual electric work which may be represented by 620 grains of copper reduced in the voltameter; the medium size, with a six inch porous pot, can reduce from 950 to 1,000 grains, while the large size gives a work equal to 1,500 or 2,000 grains. We have ourselves tried the cell, and can recommend its use to those who require galvanic electricity for telegraphic or other purposes.—*Chemical News.*

Electricity in Plants.

BY EDWIN SMITH, M.A.

[From the London Chemical News.]

There is a very interesting chapter in Becquerel's smaller treatise (in three volumes) on "Electricity and Magnetism" concerning the electrical phenomena of plants. I was induced, by reading this chapter, to make a series of experiments, with a view to illustrate the author's statements, and, if possible, to throw some fresh light upon an obscure and puzzling subject. I am now going to put together some notes of these experiments, carefully made at the time, in the hope that they may not be without a certain interest to others. The galvanometer employed is a home-made one, but tolerably sensitive. My greatest difficulty has been to depolarise the slips of platinum by means of which I have made the voltaic circuits; but every care has been taken, to the best of my ability, to obviate error arising from this cause, as well as from thermo-electric disturbance.

EXPERIMENT 1.—Take the thick, juicy leaf-stalk of the common garden rhubarb, and, having cut off a length of from 4 to 18 inches, apply a square of platinum foil to each end of the piece. Connect, by means of platinum wire, these two plates with opposite terminals of the galvanometer. The needle will be powerfully deflected. Now reverse the position of the rhubarb between its platinum surfaces, connect as before, and the needle will again be deflected, but in an opposite direction. Having previously ascertained how to interpret the movements of the needle, by noticing its behavior when a voltaic current is produced between zinc and diluted acid, with platinum for negative plate, and transmitted through the coil, you will at once conclude that a current of electricity is passing from that end of the leaf-stalk nearest the root towards the opposite end, nearest the blade of the leaf.

Experiment 2.—Cut off a piece about 3 inches long from the thickest part of the same leaf-stalk. Divide it longitudinally down the middle. Pare off a level slice of the outer cuticle. Lay the platinum slips close to the two flat sides thus provided, and connect with the galvanometer. There will be indicated a current from the outer side nearest the cuticle to the inner axis of the leaf-stalk. If the section is made thinner, there will be a current in the same direction. You may confirm your conclusion, as before, by simply turning over the piece of rhubarb, so as to reverse the current. Experiments 1 and 2 may be tried upon a thick midrib or branch of the same, taken from the leaf-blade, with a precisely similar result. A cucumber acts in the same way.

Experiment 3.—Insert a platinum wire into the lower end of the flower-stalk of peony. Apply foil to one of the large bracts, or to a petal; connect, and observe deflection. A current is detected flowing from the lower end of the flower-stalk to the bract or petal. The same experiment may be tried with a sprig of fresh oak-leaves, or bramble, or chickweed, or bunch of elder-buds, or poppy-flower, or stalk and leaves of poppy. The current always sets from the point nearest to the root towards the organs furthest from the root. If wires be inserted in the pistil of a flower and its stalk, there will be shown a current flowing towards the former.

Experiment 4.—Lay a leaf of the common dock between pieces of platinum foil. Connect the different surfaces with opposite terminals of the galvanometer, and notice the deflection. A current is indicated from the upper to the under surface of the leaf. A leaf of Spanish chestnut, or of young alder will give the same result; but, in four experiments on a leaf of sycamore, I got a current from the under to the upper surface, after a momentary current in an opposite direction. I infer, however, that the momentary current was the true one, and that the second arose from polarisation; for I obtained this latter current by merely employing filter-paper dipped in distilled water, and laid between the slips of foil.

Experiment 5.—Twist a piece of wire round the outer cuticle of a young twig of hawthorn. Insert a second wire between the bark and wood, so as to touch the layer of cambium. On completing the circuit, a current will be indicated from the cambium to the outer cuticle. Again: pass a wire into the pith, and a current may be detected taking a direction from the cambium to the pith. Instead of hawthorn, a cutting from a fresh branch of elder, laurel, hedge-mustard, thistle, groundsel, yarrow, or other dicotyledonous plant, may be employed, with, as I have uniformly found, the same effect.

Experiment 6.—Scrape off the outer cuticle of the root of cress. By means of wires, as before, test the direction of the electric currents. They will be found to flow from the outside to the axis of the root, and, again, from the root-stock, or point of junction with the stem, towards the lower tapering end. The same effects are exhibited by the root of cat's-ear, or of thistle. If plates of platinum foil are applied to the flat surfaces made by cutting across the thick and thin ends of a carrot, a current will be found to set from the thick end of this root to the smaller end.

Experiment 7.—Take a bunch of the seeds of sycamore. Dip a samara attached to the stalk near its broader end into one of the mercury-cups, and a samara attached to the stalk at a point nearer the smaller end into the other cup. A current is indicated from the former towards the latter, in strict analogy to what happened in the third experiment. Or a piece of the stalk itself may be bent, and its ends dipped into the mercury-cups. A current will be indicated, having the same direction as before. A cutting from any pliable stem may be tried in this way, and always, so far as my experience goes, with a similar result.

Experiment 8.—Pass a platinum wire through the tubular hollow of a stem of *Poa*, or some other meadow-grass. Twist another platinum wire round the outside, and connect both with the galvanometer. A current will be shown, having a direction from the interior to the exterior surface of the stem in question. Such appears to be the law with the stems of monocotyledonous plants.

Experiment 9.—Make two cuts through a raw potato, one through the centre, another near the outer coat. Apply strips of platinum to the two flat surfaces, and connect with opposite terminals of the galvanometer. A current is shown to be passing from the centre towards the outside. A lemon, treated in the same way, furnished a current from the outside towards the centre. With a turnip, a gooseberry, and a pear, the same result was obtained; but a stalk of asparagus followed the law of the potato. A boiled potato, tested, when cold, by the same method, gave a current from the outside towards the centre, the indication being confirmed by a reversal of the slice between the platinum conductors. But, after moistening a fresh piece of boiled potato with distilled water, a current was obtained from the centre towards the outside—a result confirmed by reversing the position of the slice between the platinum conductors, as in the previous trial. Fresh platinum was employed, to obviate, as far as possible, any error from polarization.

Experiment 10.—Reduce to a pulp with distilled water some of the meal nearest the coat of a baked potato. Then make a similar pulp of some of the meal at the centre. Having placed a plug of tow at the bend of a U-tube, pour the pulps thus prepared into different limbs. Connect, by slips and wires of platinum, with the galvanometer. In my experiment, a current was indicated from the outer pulp towards the inner pulp, agreeably to the result of my first experiment with a slice of boiled potato. My object was to destroy all vitality in the tuber by boiling or baking, and to see whether any chemical action might still remain—sufficient to cause a voltaic current when meal from different parts of the potato was made to furnish a voltaic couple.

Experiment 11.—Having procured a garden nasturtium growing in a flower-pot, insert a wire in the fleshy stem, a few inches above the soil. Then thrust a second wire through the small hole at the bottom of the pot into the soil. Connect with galvanometer. The needle is so deflected as to indicate the passing of a current from the plant to the soil in which it grows. Watering the soil made no change in the direction of the current when I performed the experiment. I also stuck the first wire into the stem in various ways and in various parts, always with the same results. At the same time, a current was detected passing from the root end towards the leaf end of the stem, conformably to the rule in other cases.

Experiment 12.—Make a solution of oxygen in distilled water, also a solution of carbonic acid. Pour them into the different limbs of a U-tube furnished with a plug of tow. Insert platinum slips, and connect with galvanometer. There will be a marked deflection of the needle, showing the passage of an electric current from the oxygen to the carbonic acid. Confirm the result by reversing the platinum connectors.

The foregoing series of experiments are enough to set one thinking; but I feel that it would be premature to reason upon them at present, even with the admirable clue afforded by the treatise of M. Becquerel. I should like to compare, for instance, the electrical phenomena of plants in spring and autumn, to see how far they are affected by the condition and flow of the sap. (My experiments were most of them performed last spring). In a future paper, I may, perhaps, be permitted to return to the subject, and attempt some *rationale* of the curious order of facts above described.

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Animal Free Electricity in an Infant.

The French papers report the death of an electrical child, aged ten months, at St. Urbain, near Lyons. This interesting but inconvenient infant was, it is stated, so endowed with electricity that nobody could enter the room where it was without receiving constant electric shocks. It is said to have passed away painlessly so far as it was concerned itself, but there is reason to fear that the survivors who attended it must have suffered much, for it is affirmed by doctors that at the instant of death luminous effluvia proceeded from its body and continued for several minutes after its decease. The *Medical Times and Gazette*, alluding to the case, says it is supposed to be quite unprecedented in the world of science.

Long Ago.

Among papers connected with the management of the old Magnetic Telegraph Co., in the early years of the telegraph in America, kindly furnished us by Hon. B. B. French, its first president, we find the following. It gives an idea of the great improvement in the art since attained, and the advantage of reaching direct the principal centers of business:

Office of the Washington and New Orleans
Telegraph Company,
Washington, June 29, 1848.

So many errors have occurred in the transmission of messages over the Washington and New Orleans Line of Telegraph, that I adopted a course to ascertain, if possible, at what office the errors occurred. From the erroneous messages, I selected two, and sent to each office on the line for copies of those two messages, as received and sent, from the different offices.

Both messages started at Charleston for New York; and I give below the *various transformations* they underwent on their way to this city.

FIRST MESSAGE.

Sent from Charleston to Columbia, June 20, 11 o'clock and 12 minutes, A. M.:

"For Spofford, Tileston and Co., N. Y.—Write Brigland, Sons, & Jeffrey, Liverpool, Lady Huntley abandoned at sea. Captain at Mobile. Gourdin, Mathieson & Co."

This message was transmitted from Charleston by M. H. King, operator, and received at Columbia office by Dr. Wear, operator, as follows;

"For Messrs. Spofford, Tileston & Co., N. Y.—Write Brigland, Sons & Jeffrey, Liverpool, Lady Huntley abandoned at sea. Captain at Mobile. Gourdin, Matheson & Co."

From Columbia to Camden the message was transmitted, or received thus:

"For Messrs. Spofford, Tileston, & Co., N. Y.—Write Bigland, Sons, & Jeffrey, Liverpool, Lady Huntley Abin died at sea at Mobile. Jourdan & Co."

Between the Columbia and Camden office the word "abandoned" was changed into *Abin died*, and the Captain seems to have been *thrown overboard*, as his name is omitted—one name of the signature is changed from "Gourdin" to "Jourdan," and the last name is not given. Mr. Musgrove, the operator at Camden, says in his letter to me, "I repeated it back, and was answered I. I. O. K."

It was next sent to Fayetteville, and received by Mr. Van Embergh at that office, as follows;

"Messrs. Spofford, Tileston & Co., N. Y.—Write Bigland, Sons, & Koffrey, Liverpool, Lady Hunnly Abin died at sea near Mobile. Jourdan, Matthews & Co."

Here we have "Jeffrey" changed to *Koffrey*, "Huntly to *Hunnly*, "at" to *near*; and we also have evidence that Mr. Musgrove made an error in sending me his copy, as the junior partner's name appears again, but changed from "Mathieson" to *Matthews*.

Well, the next place to which this message was sent, was to Petersburg, where it arrived thus:

"For Messrs. Spofford, Tilleson & Co.—Write Bigland, Sons, & Koffrey, Liverpool, Lady Hunnly Abin died at sea at Mobile. Jourdan, Matthews & Co."

Here we have the destination of the message—"New York," omitted, and Lady Hunnly Abin is made again to die both *at sea* and *at Mobile*.

SECOND MESSAGE.

I will now proceed to trace the second message, which started from Charleston as follows, June 21, 12 o'clock and 22 minutes P. M.

"Thomas Prosser, 28 Platt st., New York.—What price per foot of lap welds tubes, 4 inches in bore, and what thickness are they made? Should like them about one-eighth. Weldon."

This message was received in Columbia thus;

"For Thomas Prosser, 28 Platt st., New York.—What price per foot of lap welds tubes four inches, in box, and what thickness one made? Should like them about one-eighth. Weldon."

Here we have *box* for "bore," which entirely changes the sense, and in place of "are they," the word *one* is used, making nonsense.

At Camden the message was received thus:

"For Thomas Prosser, 28, Platt street.—What price per foot of lap welds 9 by and four inches in box? What thickness one made. Should like them about one-eighth. Weldon."

Here instead of "tubes" we have *9 by!!* And the designation of the message omitted.

At Fayetteville:

"Thomas Prosser, 28, Platt street.—What price per foot of lap welds, nine by four inches, in box, and what thickness? Should like them about one-eighth. WELDON."

The change here is somewhat material, the "and" being omitted after "by" and inserted before "what," and two words, "one made," entirely omitted.

At Petersburg:

"Thomas Prosser, 28, Platt street.—What price per foot of lap welds nine by four inches in box, and what thickness. Should like them about one-eighth. WELDON."

I have taken the trouble to obtain these messages from each office, and thus to trace the various blunders of the operators from office to office.

I know how difficult it is with so many repetitions of a message, to get it through perfectly correct; but, I believe that every operator on the Washington and New Orleans line, is a man of sense, and I do not believe, that with his thoughts about him, any one of them could have supposed that the question, "and what thickness one made," meant anything. Again: what man in his senses would have received "9 by and 4 inches," as meaning anything? It was the duty of the operator receiving such nonsense, to have called for a repetition, and insisted upon having something that made sense at least.

The same train of remark is applicable to the first message, for any one must have known that a lady could not have died at sea and at Mobile.

I wish messages may be transmitted as far as possible without repeating, as the frequent repetitions are a fruitful source of errors. The operators and agents will please give their particular attention to this, and, if possible, bring the line into such order, as to have it work direct from Charleston to Petersburg.

Very respectfully,

B. B. FRENCH,

Chairman of the Board of Trustees
of the Washington and N. Orleans Tel. Co.

To prevent these liabilities to error as well as to save property from waste and the sheriff, was the impelling cause of the consolidation of lines now so marked a feature in American telegraphs, the necessity of which every intelligent citizen acknowledges.

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Telegraphic Communication between Panama and South America.

The *Boletin Oficial* of the 20th instant, publishes the following documents relative to the proposed telegraph cable from Panama to Tumbes:

SR. PAZ SOLDAN'S PROPOSITION TO THE STATE GOVERNMENT.

To the President of the State of Panama:

"I, Mariano Pas Soldan, Peruvian by birth and a resident in the city of Lima, present myself before you by my attorney, Mr. S. McNider, and state: That whilst in New York I addressed myself to the Minister of the Republic of New Granada, Gen. Santos Acosta, and made the proposition to him to lay a submarine cable, which, starting from Panama, should reach to Tumbes in Peru, touching in Buenaventura and Equador; and, as the National Telegraph Company which already exists in Peru will extend its lines until they connect with the Republics of Equador, Bolivia, Chile and the Argentine provinces, the whole of the South American continent would be by this means united with North America and Europe in telegraphic communication. With this object I solicited various of those concessions which are granted by all nations to enterprises from which countries reap positive advantages; but as, unfortunately, in New Granada, the laws in this respect are especial, I am forced to limit my petition to the following:

1. A simple permission to lay a submarine cable which, commencing in Panama, shall touch at Buenaventura, and other ports which may be considered necessary, on the Pacific coast of New Granada.

2. That the Government shall bind itself to give me the preference with all its dispatches, for the same price at which any other company may propose to transmit them, from the day on which the said company has its cable laid, and in working order.

3. That for the space of ten years, no fiscal nor municipal duty or contribution shall be exacted from the Company; and that upon the expiration of this term of years no especial contribution shall be imposed upon the cable, but it will pay the general tax imposed on mercantile enterprises in proportion to its net profits.

I bind myself that within two years after the acceptance of these propositions the cable shall be concluded and at work; and if this should not be verified upon the expiration of this stipulated time, the concession shall be considered to have expired.

In the same manner I bind myself to emit five hundred £50 shares for purchase by citizens of New Granada; but if they are not sold at the expiration of three months after due notice having been given, I shall be at liberty to sell them where it may suit me to do so.

M. FELIPE PAZ SOLDAN.

LIMA, October 27, 1866.

RESOLUTION OF THE GOVERNMENT OF THE STATE.

PRESIDENCY OF THE STATE,
PANAMA, Dec. 15, 1869.

The Executive Power of the State of Panama receives with the interest which it merits, the proposition of Senor M. Felipe Paz Soldan, for the establishment of a line of submarine cable, which, starting from this city, shall place it in communication with other ports in the South of Colombia, and with the sister Republics of Equador, Peru, Chili, &c. For this reason the Executive promises to give the most efficacious aid to this important undertaking, and from now authorizes, in the part concerning the State, the permission which is asked. For that which may relate to the Government of the Union and of the Sovereign State of Cauca, information will be given to both, by the next mail, of the foregoing petition and of this resolution.

Bring this to the knowledge of the Legislative Assembly of the State and publish it in the official journal.

CORREOSO.

The Secretary of State,

MENDORA.

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Nothing Wasted.

"Mr. Mill and other thoughtful men," says *Chamber's Journal*, "are cautioning us that as our coal cannot last forever, we should do well to utilize the thirty million tons of small coal and dust which is allowed to go nearly to waste annually at the pit's mouth; and attention is drawn to what Belgium is doing in this matter. Near Charleroi, a company was formed expressly to utilize this refuse. The coal-dust is sifted, mixed with eight per cent. of coal-tar, heated to a paste by steam at a temperature of three hundred degrees, and pressed into blocks and cylinders about twenty pounds' weight. These blocks form excellent fuel for locomotives and steamboats, productive of great heat and very little ash. In various foreign countries where paving-stone is scarce, the slag from iron furnaces is brought into use, by being run into pits eight or nine feet in diameter, and cooled into slabs for paving. The cuttings of tin-plate, and worn out tin kettles and saucepans are subjected to processes which yield pure tin, good weldable iron, ammonia, Prussian blue, and stannate of sodium; and as the make of tin-plate in England and Wales amounts to more than half a million tons annually, there must be a very large store of material available in the old tin-plate which is replaced by the new. The waste flux, such as borax, used in galvanizing metals, finds a ready market among refiners, and for making paint."

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Tension—A Dialogue.

Joe.—What am tension like?

Bob.—Tension? what sort ob tension?

Joe.—Why, dere's only one sort, is der?

Bob.—Ob course der is. Spose you war slung up to de yard arm wid a rope, wouldn't de rope hab tension?

Joe.—Ah, you nigger am too clever.

Bob.—When drill master says 'tention! isn't dat anoder kind ob 'tention?

Joe.—Spose it am.

Bob.—Well which tension you mean?

Joe.—What tension I mean? I mean de galvanic battery tension what dem skyentific men talks about so much.

Bob.—Well den now repeat your question.

Joe.—What am tension like?

Bob.—I never saw'd it.

Joe.—Well but guess sumting.

Bob.—I can't guess him. I gib him up.

Joe.—Ha, ha! you clever nigger gib him up! I'll tell ye den, Bob, did ye eber go to see de Queen open Parl'ment down by de Horse Guards place in London?

Bob.—Oh, yes! and a fine sight it was too, dis nigger knows.

Joe.—Did yer find plenty room to move about dar?

Bob.—Now Joe you are joking; ob course I didn't.

Joe.—When ye war well nigh carried off yer legs close again a lamp post, did yer take it easy?

Bob.—No, Joe, dis nigger know'd how to use hims elbows and knees, and all hims oder limbs and didn't zactly see bein' gam'd agin de lamp post widout struglin' to get free.

Joe.—Ah! now ye hab him. Well, Bob, ye see tension am just like you in de crowd. De lectricity in wire does all he can to get away, but dey force him in and in till he can't stand it any longer, and den his struggles and elbowing upwards, downwards, sideways, backwards and forwards to get away am what dese lectricians call tension.

Bob.—Ah, Joe, I see ye are not sich a stupid nigger as I took yer to be after all.

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A new and valuable addition to electric literature is given in the *Electric Review*, a weekly journal published in London, under the editorship of Thomas Evans Lundy. It is a handsome quarto of 16 pages, and shows much evidence of a vigorous existence.

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PARIS, February 6.

Messrs. Thompson and Van Choate, the agents for the American Cable Company, have returned from the Hague with concession for the landing of a cable from the Dutch Government.

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INSULATOR.—H. Brooke, New York City.—January 25, 1870.—This invention more especially relates to the manufacture of glass insulators formed with a counter sink and hole or recess at the base of the counter sink with a screw thread cut in it. Great difficulty has been experienced in the manufacture of such articles by the process which has heretofore obtained of forming the insulator, counter sinking and making the hole, and cutting the screw thread therein, by one and the same operation, through the agency of a screw press. This invention consists in first forming the insulator, and making the hole or counter sink and hole therein by the action of a lever or quick press, and, before the glass has set in the mold, transferring the latter, with the hot insulator in it, under a screw press to cut or form the thread in the hole of the insulator.

GOVERNMENT TELEGRAPHS.

[Correspondence of the N. Y. Tribune.]

THE TRANSFER OF ENGLISH TELEGRAPHS TO THE GOVERNMENT—UTTER AND SHAMEFUL FAILURE OF THE NEW SYSTEM—AN EXTRAORDINARY CHAPTER IN BRITISH ENTERPRISE—CAUSES OF THE COLLAPSE.

LONDON, Feb. 27, 1870.

Three weeks ago the Post-Office took possession of the Telegraphs throughout England, Ireland, and Scotland. As that department postponed the transfer till its arrangements were deemed complete, we have had time to estimate the advantages of the transfer. There can be but one opinion—that the experiment thus far has proved a disastrous failure. Heretofore, the English Telegraph system has been one of the best in Europe; now, certainly, it is the worst. Its service is now characterised by continual delays and incredible mistakes, prompt delivery being the exception. The local London charges have been doubled for the sake of pedantic uniformity, and for double charge inferior service is given. The total collapse of the provincial system has repeatedly occurred, and London journals are filled with protests, editorial and individual. The country journals are forced to go to press morning after morning without telegrams, or with few. The House of Commons resounds with complaints; business suffers; the great mercantile communities remonstrate and petition vainly. Probably never was a period since telegraphing began when the public was so ill served. Here follows a condensed history of the service since Government had control, with evidence of dissatisfaction among all classes, and from every part of the United Kingdom.

The transfer was completed on Saturday, Feb. 5. Little was done on Sunday and Monday. The new arrangements, elaborated at leisure by the Post-Office, had completely broken down. Telegraphic communication had practically ceased throughout the United Kingdom, but six stations answering London. The Irish and Scotch wires down to Liverpool and Manchester could not be reached, and the whole west of England was cut off from London by an accident in London, attributed to a clumsy workman. The accident was repaired, but the transmission of the Queen's speech on Tuesday, containing less than 1,000 words, again blocked the wire. Commercial and private messages everywhere were detained. The country press fared still worse. *The Edinburgh Scotsman*, the leading Scotch journal, has a special wire from London, but on Tuesday had only one-third the usual news. On Wednesday it received only the last half of the report of the debate on the Queen's speech. Liverpool papers make the same statement. *The Mercury* of the 9th says Liverpool is wretchedly supplied, and the scanty news that came was comparatively worthless and unintelligible.

Manchester, Birmingham, Dublin were equally destitute. *The Irish Times* (Dublin) of the 9th, says: "London correspondence telegraphed us on Saturday, at 4 in the afternoon, was received Monday morning at 11. A letter would take 24 hours less." The Dublin Chamber of Commerce were without report of the London markets till evening. *The Birmingham Gazette* of the 11th, says: "The debate on the address was finished in the House at 8 on Tuesday evening, but it was not received for Wednesday's paper, and the different dispatches were confused." *The Manchester Courier* received the following under head of "Traffic:" "Lane and York's increase 0531 Bright's temporary retirement caused by tendency blood to head." Alarmed by such results of transferring the telegraphs to the Government, the House of Commons, on the 10th, asked the Postmaster-General for explanations. The Marquis of Hartington admitted the failure and blamed the weather, but said that business since then had been conducted with perfect success. This was a singular statement, for complaints recommenced immediately. *The Times* of the 14th, prints an account of an urgent message announcing illness, sent from Oxford at 11 on Thursday morning, and not delivered in London till 10 o'clock on Friday. The result was that a parent died before the son arrived in London.

Brokers write to *The Standard* of the same day that the new telegraph administration is an utter break-down. In their business done by telegraph with provinces, their messages formerly brought a reply in an hour and a half, but it now takes four hours, and sometimes they are not received till next day. Hence they are threatened with the "utter collapse and ruin of our business." *The News* of the 15th says that the telegraph system is not working with many of the most important towns in the three kingdoms. The Post-office again pleads bad weather. Mr. Scudamore, chief post official, sends *The Times* of the 15th a list of wires not working, including Liverpool, Brighton, Bristol, Cambridge, Hull, Newcastle, Glasgow, Edinburgh, Leeds, Birmingham, Manchester, adding: "To what extent communication is interrupted on branch lines is not known." Delay has also occurred in all communications with the continent. On Tuesday, the 15th, Mr. Gladstone introduced the Irish Land Bill. Few or no English or Scotch provincial papers received next morning full reports of his immensely important speech, though finished at eight. *The Scotsman's* report breaks off midway.

Birmingham, Manchester, Sheffield, Liverpool papers, all complain of the deficiency of the news. *The Manchester Examiner* of the 16th, half in jest and half in earnest, declares that somebody, Lord Hartington, for choice, will shortly have to be hanged unless matters mend. *The Sheffield Independent* announced a company about to run a line of stages between London and the principal towns to compete with post-office wires," which they will have no difficulty in doing." Meantime, the patience of the great mercantile communities became exhausted. On Feb. 15, a great meeting of merchants at the Royal Exchange, Glasgow, adopted a memorial expressing "their deep disappointment" at the condition of the whole telegraph system, declaring the post-office telegraph management habitually and thoroughly untrustworthy, which, under the old companies, was rarely and exceptionally the case. Instead of communication with and answer from London within an hour, as formerly, several hours are now required for transmitting a single message, while answers are very rarely received within business hours of the same day, and copies of messages by post arrive sooner than originals by telegraph.

At Liverpool, on the 17th, more than 2,000 merchants signed a memorial remonstrating against the serious inconvenience and injury suffered from the present system. "Business is partially disorganized in consequence, and unless a speedy remedy is found the general trade of the country will suffer." "Time enough," they say, "has elapsed to justify the country in expecting a service as efficient as formerly." The House of Commons, on the 17th, again demanded explanations, and the Postmaster-General again confesses to "very serious delays and very great inconvenience throughout the country," again pleads the weather, and admits that there is but one wire working from London to Dublin and one to Scotland, and does not expect matters to improve till the thaw comes. He admits delay in transmitting intelligence to the provincial newspapers, and complains that too much is sent. Mr. Scudamore informs the papers that it is impossible to transmit such a quantity: that is to say, the department decides how much news English journals shall be permitted to print. *The Daily News* next morning pronounces the explanation incomplete, ridicules Scudamore's complaint that papers want too much news as equivalent to refusing a profitable business which the department is bound to perform, and criticises not only the delays, but the bad writing of messages, wants of indication of time of dispatch, and other faults which the weather cannot explain nor thaw remedy. *The Daily Telegraph* of the 18th says the weather theory will not answer. Total interruption could be understood, but the annoyance really lies in the capricious uncertainty with which messages are conveyed along the same wires, to the same spots, about the same time. How happened Dublin to receive a full report of Mr. Gladstone's speech, and not Manchester and Liverpool? It repeats that the true explanation is the weather plus imperfect organization. *The Liverpool Mercury* of the 18th reports great dissatisfaction in commercial circles, exchange newsrooms being almost wholly without their necessary information. To business on 'Change the result has been disastrous.

Ireland fared no better than England. *The Irish Times* of the 17th says that, notwithstanding an exclusive wire from London, it was unable to get anything like the number of reports and other important matter provided at great expense. The London correspondent of the same journal writes a letter containing the announcement that what the Irish members would do with respect to the Land Bill, along with other intelligence interesting to Irish people, was suppressed on Tuesday night by the telegraph authorities. *The Manchester Guardian* of the 19th states that an effort is likely to be made in the House of Commons by several influential members to abolish Government telegraph monopoly.

The News of the 21st publishes conspicuously a long letter describing the "universal wail among business men over the complete breakdown of telegraphs in Government hands." The writer received and sent 50 messages daily, at a former time, between London and Liverpool. The message and reply averaged an hour and a half, often under an hour, and sometimes 15 minutes. By the present system, the quickest reply takes three hours, the average is six hours, and single messages often require five hours. They are incorrect also, 25 per cent of the present messages containing mistakes. He explains the causes of the present breakdown. In Liverpool, out of six offices formerly near the Exchange, five are now closed. Messages from the sixth are sent by pneumatic tube to the General Post Office to wait their turn, with others, from all parts of the town, instead of going direct, as formerly.

A Manchester merchant writes *The Times* on the 22d that he cannot get replies the same day to telegrams sent in the morning; that telegrams sent to London and Glasgow at 2 are not delivered sometimes till 7 next morning, after being confirmed by letter, and that his business is completely disorganized. He can get no redress, and implores the help of the press.

If such abuses exist in Edinburgh, Glasgow, Liverpool, Manchester, and Dublin, what must be the fate of smaller places? A London barrister writes to *The Standard* on the 21st, that being at Kirkby-Lonsdale on urgent business telegrams were forbidden to be sent him by the quickest route, via Lancaster, and that a station-master was reported for sending telegrams that way. Telegrams from London, sent

50 miles by train, as parcel messages, to the parents of a dying man, were refused by a station-master, who said that his orders were imperative to decline all messages. This is an instance of the red tape with which the whole service has been hampered.

For such a state of things, Hartington's explanations, as the London press has said, wholly fail to account. His speeches are merely official apologies, but the real explanation we need not go far to seek. The transfer to Government is a mistake, and Government management a series of blunders. Formerly several distinct companies were compelled to consult public convenience, under penalty of losing business and having no dividends. Unrestricted competition produced admirable service. The Government bought up the existing lines, consolidated them, secured legal monopoly to itself, and handed the telegraphic service over to the Post Office. The first object to the Post Office has always been revenue. It pays £600,000 yearly, and everything gives way to keeping up that surplus. The convenience of the public and the efficiency of the service are secondary considerations. The Department proceeded to work telegraphs on the same principle. Knowing that one railway can carry any number of letters, it was believed that one office could receive, and one more transmit, any number of telegrams. Service for three Kingdoms was organized accordingly. Instead of several distinct competing lines to each large town with separate officers and staffs, now there is but one line, and there is but a single office and single staff.

Formerly, if one line failed others worked. Now, when accident closes one, nothing remains to be done, for the Post Office has no second string to its bow. Under the old management total cessation, as has now happened, was never known. To the general trouble, the embarrassment to the public from abolishing old rules and introducing new and complicated forms, and the many offices intrusted to incompetent operators are added. To make confusion worse confounded, postal business, money-order business, telegraph business, are all carried on together in the same offices, and their staffs reduced to a minimum to accommodate the greater number of small towns doing little or no telegraphic business. The convenience and interests of great cities have been sacrificed. Many of these evils are neither exceptional nor temporary, but inherent in the system, and necessarily arising out of the Government control of the telegraphs. If this dispatch reaches New York in good season it will be because the Cable Company retains control of its own inland wires.

The Post Office continually promises amendment, but the service shows little, if any, improvement. Complaints continue as before, down to the date of this dispatch. *The Scotsman* of the 25th, its latest number, appears with only half a column of the Lord Advocate's speech introducing a bill on land tenure in Scotland, though *The Scotsman* always gives important Scotch debates *verbatim*. The Press Association, last week, despairing of the telegraph, resorted to carrier-pigeons for racing news from Croydon, which arrived punctually at regular intervals. To accomplish such results it was that the Government took possession of the telegraphs, paying a price so enormous as carried telegraph shares, in some cases, to three hundred per cent. It was natural that a transaction which began in reckless squandering of public money should end in penurious economy of management, reckless trifling with public needs, and peril to great public interests. There may be a gradual improvement in the service hereafter. There must be, or public indignation will compel the abandonment of the Government monopoly, and establishment of new private lines—perhaps again to be bought up at exorbitant rates, and to be followed by new confusion, and incalculable injury to business.

G. W. S.

The Electric Telegraph in Norway.

A document published by the Norwegian Administration towards the close of 1869, gives some very interesting details in regard to the telegraph extension and its effects which have resulted in the fisheries round the coasts. The peculiar configuration of the country renders the means of transit very difficult, if not impossible, in winter; consequently the fishermen who depend on the Norway and other shoals in the North Sea, are comparatively speaking isolated, besides being exposed to constant loss of nets, boats and lives, owing to the tempestuous weather to which they are exposed. During the year 1,500,000fr. credit was granted by the Storthing, or Legislative Chamber, for the creation of new lines, principally to connect the northern with the central and southern districts, and much was effected by the end of October, 1868. In November immense shoals of herring appeared off the coast, and, thanks to the telegraph, the result of the first fishing month, despite gloomy and stormy weather, was a catch equal to at least three times that for the same period of any of several preceding years. The joy caused by the telegraph extension was excessive, the opening of each new office being celebrated by illuminations and other signs of festivity. The great advantage that arises to the fishermen is that they are enabled to summon the aid of the steam vessel to collect their nets, and to convey their produce southwards.

Great care has been taken by the executive to construct the telegraphic arrangements in the most substantial manner. The wire, which is required to be of great strength, is composed of three strands twisted together. It will resist a breaking strain of from 2,000 to 2,200 British pounds. Its price, delivered at an English port for shipment, is about £48 per ton. All iron surfaces exposed to the external air are galvanized. The poles are of the Norway pine, well coated externally with pitch.

Arrangements are being made to put these northern regions in telegraphic communication with London and Paris, for the purpose of registering meteorological changes, a plan that will be of great advantage to our own seamen, inasmuch as the commencement of a northern or northeastern storm may be at once indicated to the whole of our eastern ports. The Norwegian Government has shown its high appreciation of a knowledge of meteorology, on the part of the seamen, by establishing for them popular courses of instruction on the subject, an example that might be wisely followed in this country.

◆

Electrical Theory of Earthquakes.

There is a very able paper in *Blackwood's Magazine*, July, 1869, on the electric theory of earthquakes and volcanoes. The writer explodes the absurd theory that at twenty miles below the surface the central heat is so great that the hardest granite is in a state of fusion, and that our planet consists of a molten mass nearly 8,000 miles in diameter, covered by a semi-molten crust only twenty miles in thickness, and of which crust only two miles have a temperature under the boiling point. The mean density of our planet is nearly five and a half times that of water, whereas the average density of the strata which we know is less than three times that of water, so that the central fire theory cannot be right. This latter theory is founded on the statement that in some mines and artesian wells the temperature gradually increases. But in one deep mine in Cornwall, at a certain point, the temperature begins to decline. Now, the theory advanced by the writer is this, that there is a zone of electric action in the crust of the earth corresponding with, but superior in intensity to that which every one sees to exist in the surrounding gaseous envelope of the atmosphere. The electric currents ceaselessly passing to and fro in the subjacent rocks will necessarily develope heat, and in some kinds of rock more than others. In metal mines the shaft is sunk through metalliferous strata, or through those kind of rocks most permeated by electric currents. The increase of subterranean temperature is probably restricted to a narrow zone immediately underlying the surface, with a cold dense stratum of rock underneath. Earthquakes may be, then, described as thunderstorms in the earth. When the electric action in the crust of the earth is developed to an excessive degree, and the conductive power of the rocks becomes inadequate to pass the currents with sufficient rapidity, an earthquake takes place. In severe shocks these vibrations swell into waves of commotion, extending long distance. The cyclones, or rotatory storms in the atmosphere, are due to electricity, and the earthquake which takes this form is always the most destructive, and clearly of electric origin. According to this theory volcanoes are vents which the subterranean electric action makes for itself, being eruptive; while earthquakes are vibratory. In the latter case the subterranean explosive force cannot make its way to the surface, but produce terrible vibrations. In the tropical regions the zone of electric action is most active, and hence earthquakes and volcanoes occur there most frequently.—*Builder.*

◆

Brilliant Meteorological Phenomenon.

A very beautiful phenomenon was witnessed at Springfield, Ill., on the 5th inst. At sunrise the air was heavy, with quite a fog, but before nine o'clock the sun shone forth with more than usual splendor, and the air was warm, soft and balmy, like spring. At about noon the close observer of the weather changes noticed a cool, icy feeling to the air, and a number of fleecy clouds were seen in the sky. About half-past two in the afternoon a bright, luminous band encircled the sun, upon which appeared in the eastern and western arc, bright and beautiful rainbow-tinted objects, about the size of the full moon, in mid-heavens, commonly known as sundogs. About ten degrees above the north arc of the circle around the sun appeared two beautiful and remarkably brilliant rainbow-tinted crescents, about fifteen degrees from point to point and about two degrees apart. At the same time a white, luminous band, about five degrees in width, appeared around the entire heavens, about forty-five degrees above the line of the horizon, upon which was observed, at the northwest and northeast, two bright luminous objects about the size of the sundogs mentioned above. All of these various and beautiful phenomena were visible for nearly three hours and only disappeared as the sun sank to rest in the west.

◆

Wood Preservation.

In almost every possible respect there is an analogy between the vegetable and animal kingdoms; and this is maintained in attempts to preserve their products from decomposition. Meat smoked, cooked or salt, resists chemical action of air and water simply because its albumen becomes solidified like the white of an egg. Mr. Moir, of Glasgow, has discovered the same cause and effect in the various attempts to preserve timber. The creosote so used solidifies the albumen of the wood, and thus prevents its slow but certain decomposition by the ordinary atmospheric or other causes. It effectually prevents also the action of fungus and parasitic animals. It also entirely excludes the entrance of an acid moisture into the pores of the wood.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

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FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, MARCH 1, 1870.

Up to the last authentic accounts from England the telegraphic arrangements under Government were unsatisfactory. In attempting to do too much, universal confusion and disappointment has been the result. The Press, especially, has suffered. It could not be otherwise. The telegraph is not a car into which extra boxes can be thrown and carried along, or a train to which an extra car can be attached. With added business there must be added wires and men. The Press here is under some such delusion. It is supposed that under Government every Press will get all it wants for a song. We venture to affirm that no class will find themselves so deluded should Government assume telegraphic control. Read and ponder the letter on page 84.

◆

The Argument for Consolidation.

The business arrangement by which the two great Atlantic Cable Companies have practically united their lines has, as was to be expected, occupied a good deal of public attention. By many it has been regarded as a simple attempt at monopoly, uncalled for except by those who sought to make money out of the public necessities and who therefore determined to control and absorb the avenues of correspondence between the Old World and the New. Facts, however, are stubborn things, and the discovery to both these great competitors for international business, that there was a limit to cable use even with greatly reduced rates, that the opening of the French cable had not essentially added to the number of dispatches formerly sent between Europe and America, and that its existence depended almost solely upon the ability to take business away from the rival company, forced the conviction that all that had been accomplished was a duplication of expenses, without any assurance of the ability to declare dividends upon the capital of either Company. We ventured to prognostigate this result at the first proposal to lay down the French cable. The two cables then in use were not half occupied. The rates were being rapidly reduced as experiment justified. We felt then that the laying of a rival cable would simply rob both companies of the power either to reduce their tariffs or to compensate capital. But its engineers were keen and subtle. Taking advantage of an unusually excited month during which cable receipts ran up to £2,000 per day, the nets for capital were easily baited, and the gudgeons hauled in with the most delightful ease.

To meet the ordinary dividend of 8 per cent on Atlantic cable stock, the daily receipts had to average £670 per day. On the first of May, 1869, the tariff was about $20 American currency per message, and during that month the receipts averaged £689 per day. On the first of June commenced the reduced tariff of £2, or about $12,50 American currency. During the three following months the daily receipts averaged £499, showing a reduction of nearly £200 per day. On the 15th of August the French cable commenced work. During the ensuing 5 months the daily receipts of the Atlantic cable Company gradually declined until they averaged £390 per day. The receipts of the French Cable Company had meanwhile averaged £266 per day. These figures show that there had been a fair increase in the number of dispatches as was reasonable to expect under any just tariff, but that the united receipts of the two companies did not amount to enough to pay a reasonable dividend on the capital of one. As Mr Rate, the Chairman of the Atlantic Telegraph, pointedly stated to the stockholders, "The French Cable Company had abstracted from the receipts of the English Company £40,000, and rendered dividends practically impossible." The French Cable Company recognized the existing facts as applicable to their own future. It was thus that for the sake of mutual safety and to enable both companies to preserve to the public the reduced tariff, to reduce the cost of working, and preserve value to the mutual investments that their interests have been combined. Upon a calculation carefully made, the receipts the current year have been estimated at £346,915, or enough to justify the expectation of fair dividends.

◆

A Fallacy Corrected.

Mr. Hubbard says: "The argument of Mr. Orton, that the rates per mile are less in this country than in Europe, is fallacious, because distance does not enter into the cost of telegraphing, for on a good line it costs no more to send a telegram 50 miles than it costs (to send it) 1000 miles."

The fallacy is on Mr. Hubbard's side:

If we send a message from New York to Fishkill, (60 miles), it will cost the salaries of all the operators at the intermediate offices between New York and Fishkill who are employed to work on the wire used. For, although the sender at New York and the receiver at Fishkill only are actually working, while the message is in transmission, yet all the others are on duty, and earning salary, as much as the two who are actually operating.

And if we send a message from New York to Buffalo, (say 500 miles), it will cost the salaries of all the operators employed to work on the wire in use in the offices intermediate to New York and Buffalo. Thus the Company is at the cost of not only paying for the additional operators on the 500 miles of line, but these men are earning nothing for the Company. To this cost we must add the rental and expense of maintaining the superadded offices on the long line of wire, which for the moment are unproductive. Then, in addition to the increased cost of constructing the long line of wire, is the increased cost of repairers, inspectors, &c. These increase in proportion to the length of line.

Mr. Hubbard has much to learn, if he thinks that the only, or the chief, cost to a telegraph company transmitting messages, is the salaries to each of the two operators actually at work on the message.

The converse of Mr. Hubbard's proposition is true. It costs a telegraph company, which has a long line constructed and in use, as much to send a message 50 miles as to send it 500 miles. For while the message is in transmission no other message can be sent; consequently, all the operators are unavailable although being paid. And hence it is true, in one sense, that it costs no more to send a message to Buffalo than it does to send it to Fishkill, provided the telegraph company have to maintain the lines constructed between New York and Buffalo. But if a telegraph company has only a line between here and Fishkill, it will cost it very much less to maintain this line than it would cost to maintain one between New York and Buffalo. Therefore, it would cost the latter company more to send a message to Buffalo than it would the former to send one to Fishkill, and Mr. Hubbard's statement, though perhaps literally true, is fallacious. We notice this fallacy, for we have heard the same statement frequently before; but wonder how any thoughtful man can believe it.

The truth is, that the adjustment of the tolls for a telegram, in proportion to the distance required to be sent, is as nearly accurate as the charge to a traveller on a railroad pro rata per mile that he may travel on the road; whereas the advantage rendered to the customer, for sending a telegram is very much increased as the distance is increased.

◆

Telegraphic Communication with India Complete.

The submarine cable from Bombay, India, to Aden, at the mouth of the Red Sea, has been successfully laid by the steamship *Great Eastern*. This link places England and her Indian colonies in direct telegraphic communication.

◆

There is no likelihood that Congress will pass any act, during the present session, for the establishment of Governmental Telegraphs.

◆

The Cuba Submarine Telegraph Company.

This company has been organized to fill up the gap between Havana, Cuba, and Santiago de Cuba on the southeastern extremity of the Island. A land line of 30 miles from Havana to Batabano, the nearest point on the south side of the Island, will be built, and from Batabano to Santiago a sea cable will be laid, the distance between these two ports being 540 miles. To accomplish this the Spanish Government has already accorded an exclusive connection for forty years, at the same time engaging to bring business to the cable, from which a revenue of $40,000 per annum is expected. This line when completed will unite the lines of the International Ocean Cable Co. with the West India and Panama Telegraph Co. The cable is expected to be laid at the same time as the cable to Panama, both of which are expected to be completed and laid down before the first of July. So we go. Before summer is over we may rely on communication with Aspinwall and all the important West India Islands, perhaps even with Peru and many of the South American Republics.

◆

The French Atlantic Telegraph Company, at their last meeting, declared a dividend of one and three-quarter per cent. for five months, being from the opening of the time for business on the 15th of August, 1869, to January 15th, 1870, the date of agreement with the Anglo-American, Atlantic and New Foundland Companies.

◆

The stockholders of the British and Irish Magnetic Telegraph Company have received from Government £185 for each share of £100. The dividends of the Company have amounted to 12 per cent. per annum, and the Government purchase is equal to a 15 years revenue. £2,000 gratuity was voted Mr. Bright, the Secretary, and £4,000 to the staff. The Directors received a gratuity of £6,000. The winding up was charming.

◆

The result of recent Cable arrangements is the establishment of reciprocal rights to land cables on the European and American shores.

The earnestness with which Congress is now investigating all the facts connected with the operation of the Telegraph in the United States, indicates a just perception of the important position which it holds in the public mind and in the national activities.

The question in one of its aspects is a very simple one. Shall the telegraph be managed by citizens on such a basis of tariff that fair dividends can be realized from it as a legitimate enterprise; or shall Government purchase the lines, domicile the offices with the postal buildings, and conduct it for the people at the cost of service? The arguments and results of both of these conditions seem easily stated. The first promises vigor, the other cheapness. The one proposes to take its chances among other enterprises and secure success by meeting most closely public wants; the other would grasp the system in its own hands to secure a delusive economy, and become not a monopoly merely, but in the very nature of things, a political and irresponsible power. The one stimulated by its interests and unshackled in its administration, would meet easily and promptly every new demand; the other would be so fixed by official and legislative limits, that, like the crocodile, it could not change its path or swerve to meet an unexpected want. The one would carry the system forward as an integrant of society, touching and responding to its impulses, dependent upon it for existence, and illustrative of its energy; the other would feed the public with a spoon and educate the people to continental weakness and servility. The one would by the nature of its dependence on the public meet the people at open counters and with courtesy and respect; the other would frown through square holes and slam their small doors in the face of any man who might undertake to utter a complaint. Such at least are the tendencies of the two conditions. When we add to them the sensitiveness of political parties, the element of political preferment which so far adheres to every governmental position that telegraph operators would be regarded as state adherents, the espionage which could not fail more or less to follow partizan control, we cannot bring ourselves to believe that the telegraphic system of the United States can ever be brought permanently under such conditions.

What we do believe is, that before many years the entire international telegraph system of the globe, as well as its local or home operations, will be under the control of representative men of the different nations so as to secure a just, unique, and economical and unpartizan administration on some simple basis of tariff, and under such legislation as, while protecting capital, will prevent its undue compensation, and demand its surplus earnings to be devoted to the increase of its facilities. The walls erected by multiplied organizations must give way. The service must be conducted under the most simple conditions. The partisanship of governmental control must be kept out, and yet the whole management be under such united legislative and social control as shall stamp the entire system as eminently just, popular, unpartizan and patriotic.

Above all we reject as false and vicious any such lowering of tariffs as would compel ravages upon labor and cheapen the price of intelligent toil. The wires are the brain roads of the world, and we hope the workers thereon may ever be representatives of the advancing civilization of which the telegraph is the last and noblest exponent and aid. To degrade labor is to enervate the State.

Injured Innocence.

"We have met our first Bull Run. Let us not accept it as a final. Defeat is not death. Let us learn well the lessons of the hour end *and strengthen ourselves for a future trial!*"—*Bucolics of the Telegrapher*, Feb 26, 1870

TARIFF BUREAU.

Semi-Monthly Circular.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
MARCH 1, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since February 15, the date of the last tariff order. Please note them in your tariff book:

Atlantic Cable Business.

On and after March 1st, the "date" and "place from," if inserted by the sender, must be included in the count, and charged for. If not inserted by the sender, the name of "place from" must be added to the check.

RATE TO SAN FRANCISCO, CAL.

and points on direct line between San Francisco, Cal., and Omaha, Neb.:

On and after March 10th, the rate from offices in Me., N. H., Vt., Mass., R I., Conn., N. Y., N. J., Penna., Del., Md., D. C., and W. Va. to San Francisco., Cal., and offices on direct line between San Francisco, Cal., and Omaha, Neb., will be five dollars currency, or four dollars gold; and from offices in Ohio, Ind., Mich., Ill., Wis., Iowa, and Mo., and Louisville and Covington, in Ky., to same points four dollars currency, or three twenty-five gold. *It is to be understood, however, that if the present rates are less than the foregoing they will remain in force.*

The following is a list of the offices, on line between San Francisco and Omaha, referred to in foregoing order:—

Alameda, Cal
Alta, "
Argenta, Nev
Auburn, Cal
Boca, "
Bryan, Wy
Cheyenne, Wy
Carlin, Nev
Carter, Wy
Columbus, Neb
Corrinne, Utah
Cyciseo, Nev
Colfax, Cal
Dutch Flat, Cal
Elko, Nev
Echo, Utah
Emigrant Gap, Cal
Fremont, Neb
Ft. McPherson, Neb
Ft. Sedgwick, Col
Ft. Bridger, Wy
Gold Run, Cal
Grand Island, Neb
Kelton, Utah
Livermore, Cal
Laramie City, Wy
Menlo Park, Cal

Mountain View, Cal
Newcastle, Cal
No. Platte, Neb
Oreana, Nev
Ogden, Utah
Oakland, Cal
Point of Rocks, Wy
Pleasanton, Cal
Promontory (Summit), Utah
Rawlins, Wy
Redwood City, Cal
Reno, Nev
Rockland, Nev
Roseville, Cal
Sacramento, Cal
Sidney, Neb
San Jose, Cal
San Mateo, Cal
Santa Clara, "
Stockton, "
Summit, "
Terrace, Utah
Towuno, Nev
Truckee, Cal
Verdi, Nev
Wadsworth, Nev
Winnemucca, "

NEW OFFICES.

358 Arenzville, Ill.
47 Beverley, N. J. re-opened.
368 Burnside, Ill
358 Beardstown, Ill.
358 Concord, Ill.
212 Cable, O.
447 Fontana, Ks.
358 Greenfield, Ill,

357 Keithsburg, Ill.
Kit Carson, Col., 25c. more than Sheridan, Ks.
358 Merrill, Ill.
359 New Florence, Mo.
357 Oquawka, Ill.
155 Rock Hill, S. C.
358 Winchester, Ill.

OFFICES CLOSED.

Mahoning, Pa. and Salem, N. H.

GENERAL INFORMATION.

Business for Northfield, N. H., will hereafter be checked to Tilton, N. H., tariff as heretofore. Business for Cambridge, Mass., will be checked to Cambridgeport, Mass , delivery charges 25c., and So. Hadley and So. Hadley Falls to Holyoke, Mass., delivery charges for the former 1.75, and for the latter 25c. The tariff in addition will be same as to the point checked.

Auburn, Skaneateles, and Seneca Falls, N. Y., should be added to list of offices having "special sheet A" published in *Journal* of Jan. 15th, 1870.

The tariff to Ogden, Utah, heretofore given as 300 more than Omaha, Neb., should not be over 250 more than that office.

P. O. address of Templeton, Mass., is Otter River, Mass.

The following is a revised list of Offices of the Union Pacific Railroad Company, with rates for other lines from Omaha, Cheyenne and Ogden. To go into effect immediately:

FROM OMAHA, NEBRASKA.

Brady Island,	Neb.,	125.9	Plum Creek,	Neb.	130.8
Elm Creek,	"	115.8	Papillion,	"	35.2
Elkhorn,	"	40.3	Schuyler,	"	75.8
Gilmore,	"	30.2	Silver Creek,	"	90.8
Kearney (Sta.)	"	110.7	Valley	"	50.3
Lone Tree	"	90.6	Wood River	"	105.7
McPherson (Sta.)		145.10	Willow Island	"	125.8
No. Bend	"	70.5			

FROM CHEYENNE, WY.

Alkali,	Neb.	120.8	Carbon,	Wy.	110.7
Antelope	"	65.4	Creston,	"	125.8
Archer	Wy.	30.2	Ft. Steele,	"	125.9
Big Springs,	Neb.	110.7	Granite Canon,	"	40.3
Bushnell	"	55.4	Hillsdale,	"	35.9
Buford,	Wy.	80.3	Hazard,	"	30.2
Bitter Creek,	"	140.9	Julesburg,	Neb.	100.7
Cooper's Lake,	"	85.6	Rock Creek,	Wy.	100.7
Lodge Pole,	Neb.	90.6	Red Desert,	"	130.9
Lookout,	"	95.8	Red Butte,	"	70.8
Medicine Bow,	"	105.7	Sherman	"	35.4
O'Fallons,	"	130.9	St. Mary's	"	130.9
Ogallala	"	115.8	Separation,	"	125.8
Potter,	"	70.5	Table Rock,	"	135.9
Pine Bluff,	Wy.	45.3	Washakie,	"	130.9
Percy,	"	115.8	Wyoming,	"	30.3
Como,	"	100.7			

FROM OGDEN, UTAH.

Aspen,	Utah	110.7	Green River,	Wy.	160.11
Almy,	"	105.7	Hallsville,	"	175.13
Black Buttes,	"	175.13	Point of Rocks,	"	175.13
Bridger (Sta.),	"	120.8	Piedmont,	Utah.	110.7
Castle Rock,	"	90.8	Rock Springs,	Wy.	160.11
Church Buttes,	"	125.8	Salt Wells,	"	165.11
Carter,	"	120.8	Uintah,	Utah.	30.2
Devils Gate,	"	40.3	VanDykes,	Wy.	175.12
Evanston,	"	105.7	Weber,	Utah.	50.3
Granger,	"	130.9	Wahsatch,	"	100.7

WILLIAM ORTON,
President.

Telegraphers' Mutual Life Insurance Association.

ASSESSMENT NO. 11.

John Houlehan,
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Wm. Riddle, Jr.,
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A. Weller,
S. Robertson,
D. H. Henshaw,
Thomas M'Bride,
M. D. O'Connor,
L. B. Greene,
G. K. Wood,
W. F. Shiebler,
T. J. Landy,
R. Waterman,
H. E. Doolittle,
John A. White
C. Oscar Blake,
J. M. Dechtell,
W. W. Kelchener,
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W. O. Lewis,
James Farrell,
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Jas. A. Remley,
W. H. Sawyer,
Geo. L. Lang,
P. H. Shaughness,
A. S. Downer,
J. R. Dowell,
E. M'Carthy
R. M. J. Paynter,
Joseph M'Govern,
Geo. M'Govern,
Wm. S. Taylor,
N. C. Pamplin,
Geo. B. Gaales,
Thomas L. Crouch,
Geo. R. Pace,
Theo. A. Pace,
J. D. Alley,
Geo. W. Alley,
J. P. Keene,
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J. C. Wilson,
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On Thursday, Feb. 24th, 465 messages passed direct between New York and New Orleans, over the wires of the Western Union Telegraph Co.

◆

The Industrial Publication Co. of New York have issued the first number of a new illustrated monthly, especially devoted to "Engineering, Manufacturing, and Building," and named "The Technologist." It is edited in part by our old friend John Phin, the most industrious, wide-awake, untiring of men, and whose work we can see all through its 32 large and handsome pages. In alluding to the term "Technology" as the equivalent of the old Saxon word "Handicraft," the editor very gracefully says:

"What after all are all our great engines and tools but merely extensions of the little hand of man, that hand, which, according to the Hindoo proverb, is 'the first, the best, and the most perfect of instruments.' Or as was beautifully said by George Wilson, late professor of Technology in the University of Edinburgh, 'an electric telegraph is but a long pen for the little hand to write with, and all our great cannons and other weapons of war are only Cain's hand made larger, and stronger, and bloodier."

Atmospheric Electricity of Haiti.

M. Ackerman.—The Island of St. Domingo, as it is also called, is situated between 17deg. 53min. and 19deg. 58min. N. latitude, and between 70deg. 45min. and 76deg. 55min. latitude W. from Paris. According to the author, who has, during a series of five years, made meteorological observations at Port au Prince, there bave, on an average, been 129 days of each year either severe thunderstorms, or other very marked electrical phenomena, especially during the months of May, July, August, and September. Severe thunderstorms more frequently occur during day than night-time. The year 1868 was especially remarkable for severe thunderstorms; during one of these, lasting for forty-five minutes, 400 lightning flashes were distinctly seen.

HOE YOUR OWN ROW.

BY ALICE CAREY.

I think there are some maxims
  Under the sun
Scarce worth preservation,
  But here, boys, is one,
So sound and so simple
  'Tis worth while to know;
And all in a single line!
  "Hoe your own Row!"

A good many workers
  I've known in my time—
Some builders of houses,
  Some builders of rhyme;
And they that were prospered,
  Were prospered, I know,
By the intent and meaning of
  "Hoe your own Row."

I've known, too, a good many
  Idlers, who said,
I've a right to my living,
  The world owes me bread!
A *right!* lazy lubber!
  A thousand times No!
'Tis his, and his only,
  Who hoes his own row.

◆

W. H. Champlin has been appointed R. R. agent, operator, and express agent at St. Elmo, Fayette Co., Illinois.

How to Make Precious Stones.

Theophilus Ladislas Zschereskofski, a pupil of Liebig, has succeeded in making a discovery which promises to revolutionize the trade in precious stones. He has succeeded in making silicious and aluminous ethers: and it is said that by simply mixing a certain quantity of these ethers with other chemical elements, he produces almost instantaneously the most magnificent results. Combined with the oxyde of iron in a perfectly pure condition, the aluminous ether makes a ruby; with sulphate of copper, a sapphire; with any of the salts of nickel, an emerald. With the salts of chromium the silicious ether gives all the beautiful varieties of the topaz. These ethers evaporate with a very subtle and pungent odor, which some people find highly agreeable. The salts crystallize with perfect regularity on the evaporation of the ether. Although the corundums obtained by this process have not the extreme hardness of the natural substance, yet their brilliancy when the operation is carefully conducted is admirable. Silex and aluminum, the bases of the flints and clays, are elements to be found all over the globe, and the process of manipulating them into gems, though one of extreme delicacy, requires no costly apparatus and no expensive materials.

Laying and Raising Submarine Cables.

A series of interesting facts in reference to the submergence of new, and the recovery of already laid submarine cables was afforded by Professor Fleming Jenkin at a lecture given by him in June, 1869. The weight of the last laid (British) Atlantic cable was 2,740 cwt. In laying it, the Great Eastern was going at the rate of six knots an hour, the cable passed out at an angle of 6½ degrees only, so that the inclined plane between the ship and the bottom was seventeen miles long. The motion of the vessel in rolling, &c., had little effect—the greatest strain never exceeded one-tenth of the breaking strength. The method and machinery for recovering cables is practically the reverse of that used in laying them. Including the French Atlantic cable, the total of all long submarine cables existing in 1869 was nearly 14,000 miles.

Journal of the Telegraph.

Books on Telegraphy.

D. Van Nostrand, Publisher, 25 Murray and 27 Warren streets, New York, has sent us two English telegraph works, which ought to be in the hands of every man interested in the art, viz.: "Culley's Hand Book of Practical Telegraphy," and "Sabine's Electric Telegraph." The former of these is a book containing the most advanced knowledge of the science in its higher forms, although containing much that is of interest and within the capacity of the ordinary student. Its character may be judged by its list of contents, which are:

1. Sources of Electricity.
2. Resistance and Laws of the Current.
3. Magnetism.
4. Induction.
5. Atmospheric Electricity.
6. Insulation.
7. Construction of Lines.
8. Testing.
9. Instruments and Switches.
10. Underground and Submarine Lines.

Mr. Culley is now the Government Engineer of the British Telegraph Lines, and his book is exceedingly interesting, and from which we purpose making extracts on some points regarding which there is much confusion of thought. The book is splendidly printed, and is one of the issues of Longman's, the celebrated London publishers.

Sabine's Electric Telegraph is more historical, as may be gathered from the list of contents:

1. Early Observations of Electrical Phenomena.
2. Telegraphs by Frictional Electricity.
3. Telegraphs by Voltaic Electricity.
4. Telegraphs by Electro Magnetism and Magneto Electricity.
5. Telegraphs now in Use.
6. Morse Telegraphs.
7. Automatic Telegraphs.
8. Dial Printing and Electro Chemical Telegraphs.
9. Overhead, Submarine, and Underground Telegraphs.
10. Atmospheric Electricity.

This work is printed by Mr. Van Nostrand, and is a neat, handsome volume, profusely illustrated, and written in an easy, popular style. The author, Robert Sabine, is one of the most accomplished of English Telegraph Engineers, and no man is better posted in the art, both in its history and practice.

Mr. Pope has placed his recent work on the "Modern Practice of the Telegraph" in the hands of Mr. Van Nostrand, who now issues it in an improved form, and of whom it can hereafter be procured.

If we can aid any who desire these or other books published by Mr. Von Nostrand, as may be found in his advertisement, to which we ask attention, we shall be glad. Orders to him will receive prompt attention.

◆

The New York *Herald* reports the following proposition of Mr. Orton to the committee on the postal service of the United States as a part of his address delivered before them on the 24th inst. If Government really desires control, and the opportunity of a demonstrative experiment, it is thus offered without even paying interest on the cost of the lines, and on terms which cannot be regarded other than just to the holders of telegraph stock:

Let Congress provide for a commission to ascertain and fix the cash value of our property and franchise, on which sum we shall be entitled to earn and divide annually to our stockholders ten per cent. We will then surrender to the Post Office Department the right we now possess, to fix and modify tariff rates, so that as fast as the actual capital exceeds ten per cent the surplus may be applied to the reduction of rates in such a manner as the Post Office Department shall direct. If the rates proposed by Mr. Hubbard can ever make the business self-supporting they will ultimately be reached by this plan, under which all the facilities the Government can supply can be availed of to the fullest extent, but without incurring any expense or assuming any responsibility.

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A pamphlet setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

Electrical Phenomenon.

A letter in the Ottawa (Ill.) *Republican* gives the following account of an electrical phenomenon: In the engine room of the Peru plow factory there is a leather belt from eight to ten inches wide. This belt is drawn over two drums, one of which is iron and the other, I think, is wood. These drums make about fifty revolutions per minute. Standing in front of and below the belt and placing the extended fingers within six inches of it, the experimenter will observe a multitude of white rays, which start from the belt and project themselves in the direction of the fingers. For the first three inches the rays form a sheet of white light, its base extending across the band. It then breaks up into pencils of rays, each pencil converging to a delicately fine point. The points of the white rays approximate at the tips of the fingers, but never touch them. On the contrary, the ends of the fingers are illuminated with little jets of bright yellow flame, which dart out to meet the white rays. The little flames are lambent, continuous and pencil-shaped. They are not as vivid as a true electric spark, but sufficiently bright to be visible by daylight. If a person, holding his right hand near the belt, touch any one in reach with his left hand, he will experience a sensible shock. The fingers, after experimenting with the belt, have a pricking sensation, not unlike the feeling produced by restored circulation after the hand has been "asleep," or when we carelessly meddle with the poles of a magnetic battery.

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I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and the payment of dues.

XI. A meeting for the election of officers shall be held annually during the first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written request of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

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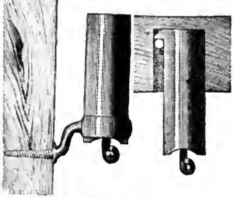

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JOURNAL OF THE TELEGRAPH.

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Materials for Telegraphic Insulators.

Ebonite insulates much better than glass, and is far less apt to become damp than even porcelain. It is the best material yet known for the insulation of electrical apparatus. Compared with porcelain or earthenware, it less easily becomes wet in mist, but more easily in rain. Rain forms detached drops upon a surface of earthenware, but covers ebonite with a continuous film. Thus the latter acts with most advantage when it forms the inner cup of a compound insulator, and is protected by earthenware from the direct action of rain.

The surface of ebonite becomes rough and spongy, so as to retain dirt, and it matters not how perfect the substance of the insulator may be if its surface is defective.

But although ebonite will not maintain a high state of insulation for a long period, it may be advantageously used in certain cases to secure freedom from accidental interruption; for it is not liable to be broken, nor does it seem to afford temptation to stone throwing.

The best material for an insulator is a really good porcelain, thoroughly vitrified, so as to insulate perfectly even when unglazed. Its value arises principally from its polished smooth surface, which resists the formation of a continuous film of moisture, does not retain dust, and is washed clean by rain.

The objection to porcelain is, that considerable skill is required to select it, and to distinguish between a good and an inferior sample. As it is a compound of several substances, it is difficult to secure uniformity of composition, and much is left to the care and honor of the manufacturer.

Though a good glaze does not deteriorate by age or exposure to the weather, it is difficult to distinguish between a good and a bad glaze by inspection or electrical test, and it is quite possible that a glaze which appears good and insulates well, may crack by age.

Brown stoneware is both excellent in quality, cheap, and durable. Its surface is not equal to that of porcelain, so that it never insulates so well as the best specimens of the latter, but the glaze never cracks. Again, it is not a compound; so that when a manufacturer possesses a suitable clay, and takes care in its preparation, the uniformity of his ware may be depended on. It is also comparatively easy to distinguish its quality, and to detect faults in its manufacture.

Small pieces of ware are more easily burned, and therefore more likely to be perfect than large ones. There is, therefore, a great advantage in forming an insulator of separate hollow pieces or cups, placed one inside the other and fastened with cement; if one is defective there is a probability that others will be sound, and if the pin or bolt be covered with an insulator (such as ebonite), insulation will not be destroyed if the earthenware be entirely useless.

All insulators should be tested before they are used. Part of the glaze should be ground off to test the body. They should be placed in a trough of dilute sulphuric acid, or salt and water, allowed to remain several hours and tested with 250 cells and a delicate horizontal galvanometer, to prove if the bolt is perfectly insulated from the liquid in the trough, the edge of the insulator being slightly greased to prevent the water spreading over it. The acid must be very carefully washed off after the tests. From its power of repelling water, grease greatly aids insulation in damp weather; paraffine, again, enormously improves it; so that in testing samples it is necessary to ascertain carefully that they have not been coated with these substances.

In order to learn the comparative value of different kinds of insulators, they should be fixed upon standards in sets of not less than 10, exposed to the rain equally on all sides, and tested when the weather is uniformly wet. Almost any insulator will suffice in fine weather, while that which tests best in slight rain may not give the same result in extreme wet, when the insulation is most tried.—*R. S. Culley's Handbook of Practical Telegraphy.*

◆

LONDON, Feb. 15, 1870.

Since the electric telegraphs have been in the hands of the Post Office there has been the most complete break-down in the working of the various lines, which the worst enemies of consolidation or centralization could have anticipated. The weather certainly has been very bad. For two days there has been a storm of unexampled severity, and the Thames, between, as well as above the bridges, is almost as frozen as the Neva; but making every excuse on these grounds for defects which have driven business near crazy, the fact still remains that a Government department has not the same "go" in it as private enterprise, stimulated by competition. Mr. Scudamore's reputation as an organizing genius is oozing out at his finger's ends.—*Cor. of the Toronto Globe.*

◆

Amalgamated Iron in Voltaic Batteries.

The inventor has used the amalgamated iron in place of amalgamated zinc in the voltaic battery, and found that cylinders of sheet-iron amalgamated in this manner give a much stronger and more uniform current than those which were not amalgamated, and that the currents thus produced are but little inferior to those evolved by zinc itself. If we take into consideration the fact that the price of iron is but one-quarter that of zinc, and that the electric value of a given weight of the two metals is as the chemical equivalents 27 : 32, 30 that iron possesses about five-sixths the electric value of zinc, we cannot fail to perceive the great gain which must accrue from its use. To this must be added the fact that the product of the battery, which in telegraph offices is considerable, is, in case of the amalgamated iron battery, sulphate of iron, which is of more value and much more extensively used than the sulphate of zinc that forms the product of the amalgamated zinc batteries. The method of amalgamating iron will be found described in the present number.—*The Technologist.*

DETECTED BY ELECTRICITY.

A Somnambulistic Murderer Reveals His Guilt.

I am now a telegraph operator of twelve years' service; but my story requires that I revert to the time when, poor and penniless—my father dead—my poor mother was striving with all her earnest might to keep our little family together. Alas! the strength of woman is unequal to the determination of her mind, and my poor mother, overcome by her great exertions for the support of myself and sister, died five years after my father's demise. Thus my sister and myself, aged respectively ten and twelve years, were thrown upon the mercy of a cold and pitiless world, without money, without friends, and, as I then thought, without relatives, but I have found many of the latter in my more prosperous and independent days.

I remember quite distinctly how I fared the first day that I attempted to get work. Everybody looked upon my tidy suit and ingenuous countenance as the worst symptoms of depravity and innate dishonesty, turning me away without a civil or sympathetic word. In vain I told my story, and pleaded a desire to do anything. It was the same thing for a week, when one night, worn out by fatigue and the many rebuffs which I had received, I turned my steps homeward, and when going down a narrow and obscure alley—I now avoided the more crowded thoroughfares—I became unmanned all at once and burst into a bitter and burning flood of tears. I really thought my heart would break, and Heaven only knows how long I might have remained there weeping but for an interruption which proved the turning point in my life. I felt some one touch me upon the shoulder and ask me very kindly why I cried so.

'If I were to tell you,' replied I, 'you would say I was a vagabond, and ought to be in the orphan asylum or workhouse.' 'No, child,' said he, 'you may be sure of my sympathy if you tell a truthful story, so dry your tears and tell me all about it.' I felt my heart warm toward him at these kind words, and told as shortly as possible our whole little history, as simple as it was. 'You are a noble boy,' said he, as I finished my narrative, 'and deserve some reward. Where is this little sister of whom you speak so affectionately?' I told him. 'Well, would you like to take me there? I would like to see her, and if you have told me the truth, I think I can probably put you in the way of employment.'

I assented at once, and he followed me to our home, which was then only a few blocks distant. I was delighted at the evident pleasure and gratification with which he saw and kissed my dear little sister Minnie. I thought, in fact, that he would never tire of holding her in his lap, and telling her pretty stories. On the morrow he came with his wife, who was delighted with Minnie's auburn curls and blue eyes, and took her to her home, while I went with Mr. Howard. He promised me that Minnie should be adopted into his childless home, and I should at present be employed as messenger in the telegraph office, with the hope of advancement according to my ability.

At the office I became acquainted with another messenger by the name of Charlie Durbridge, whose eccentricity of character struck me very forcibly at that age. Like myself, he had been taken out of the street by Mr. Howard, and placed where he now was. I was often grieved and shocked, however, by his want of gratitude for Mr. Howard, because he had many fine qualities, considerable education, and almost an inimitable tact for amusing us boys. We used to familiarly call him "Dully," for no other reason, I think, than that his character in no way deserved the appellation. We always ran together, and when there was a possibility of our getting away from the office for a few moments, we could generally be found in one or other of the parks, conversing on what we considered abstruse subjects. We became, in fact, almost inseperable, and dissatisfied without we were together.

Thus passed a year, when Mr. Howard told us that we were to begin learning telegraphy. It was slow work for me, but Dully was an apt scholar, and he at the expiration of six months had become a pretty fair 'paper operator,' and was sent to a little station called Avonville, some twenty miles away, his principal duty being to report trains, and receive coal orders for a mine near there. He was also agent for the railroad. Eventually, I, too, became a reliable operator, and was sent to an unimportant station in the opposite direction from Avonville, called Stuart. I was also upon a railroad, and as we travel free upon them all could visit my sister at N—— every Sunday if I chose to do so. I felt her absence very forcibly now, but as I had become quite self-sustaining in my fifteenth year could stand it better than I had at first supposed.

Mr. Howard ran down occasionally to see how I was getting along, and used his influence among the citizens for making my stay there pleasant and agreeable. My greatest trouble was the rudeness of older operators over the line, and I lay it down here as a maxim that operators have less patience than any other profession of men. Still, I never wavered, but did the best I could and as near right as possible. I heard from Dully occasionally; he was fast becoming a 'sound operator,' in fact was sanguine of accomplishing it in six months. I was somewhat anxious about his morals, concluding from what few remarks I could elicit from him, that he was rather 'fast.' His letters were always pleasant, however, and were my most welcome visitors. About twelve months after taking charge of Stewart, Dully told me he was going to N——, as Mr. Howard considered him competent to work in that office, and in a few weeks sure enough I heard him over my line forwarding and receiving the most lengthy telegrams at the rate of forty words per minute.

I was not envious of Dully's success, but on the contrary, resolved to emulate him, and get the place in N—— which Mr. Howard had long promised me; however, I was doomed to remain at Stewart until my seventeenth year, at which time I was considered a fair "sounder," and was called into the main office. I believe this was the happiest event of my life; indeed, I had worked hard, and felt that I deserved the promotion. I was not by any means the best operator in the room; in fact, there were several better ones, beside Dully, who could copy faster writing, and more legibly than myself. The operators were rather inclined to regard my arrival as an innovation, thinking me, no doubt, a favored individual; but I soon proved to them that I could easily do what was required of me, and I will here do Mr. Howard the justice to say that he never advanced his friends only as they rendered themselves worthy of promotion.

Dully had taken rooms with several more operators, and from what I could learn, and from what I afterward saw, I became convinced that he was leading a very high life; in fact, I could not see how he managed to live so well on the salary he was then getting. I never ventured to remonstrate with him but once, when he seemed to be so much hurt and annoyed that I never ventured to do so again. I noticed that he afterward treated me with some reserve, and eventually with marked coolness. I don't know how we ceased to go together, but we have all had such experiences, and there is no necessity of particularizing. Suffice it to say that he took a table in the other end of the room, and I very seldom saw anything of him, though I knew him to be leading the same wild, reckless life. Mr. Howard spoke to me about it once, when I told him what I had done and the result. He seemed to regret Durbridge's course very much, and I saw that he was displeased also. For five or six months it went on this way, seeing each other very seldom, and then with scarcely any recognition.

One morning I was surprised to see him, after coming into the office, walk directly to my table and sit down by me. I saw that he had been drinking and was considerably excited.

'Wilmore,' said he, 'I've come to tell you good by.'

'Why, Dully, you are not going away? What do you mean?'

'Yes. I am going this morning; your friend, Mr. Howard, has ordered me back to that miserable hole at Avonville.'

'I know Mr. Howard is a friend of yours, Dully, and will not do anything but what is right.'

'No,' said he, 'Howard is a vil—'

'Dully, you must not speak of Mr. Howard in that manner. If you have no more respect for yourself or gratitude for his many kindnesses, I think you had better not talk to me.'

'Very well,' said he, extending his hand, which I refused to take.

'Will you not tell me good-by, Wilmore? You know I always liked you.'

'No,' I replied, 'not unless you apologize for the insult you have offered Mr. Howard and myself.'

'Very well, then,' and he went down stairs.

I never knew from what cause this had been done, but I am satisfied, from what has since occurred, that Mr. Howard was aware of some crime which he had committed, and was endeavoring to shield him from the law. I was appointed chief operator not long after that occurrence, and had to exercise a general supervision of all the lines that led into the office. I had been holding this position over a year, when the sad events occurred which I have to relate. Mr. Howard had been absent for several weeks, on an inspection tour, and was expected back on this evening. I remember that his wife was very much disappointed at not meeting him when the train came in, and had sent me a note asking me to ascertain the occasion of his delay. I spoke to Durbridge about it, asking him where Mr. Howard was. He replied very shortly, telling me that he had not heard from him, and was not interested in his whereabouts.

It was Sunday night, and about 12 o'clock, I found myself alone, the night operators having all gone home. Presently I heard 'N' called in a very rapid and excited manner, and ran to the key. It was Avonville, and I answered at once. Without a word of warning or explanation, he sent me the following dispatch, which has become indellibly fixed in my mind, and I will give it as 'S,' this was the signal for Avonville office, gave it to me:

AVONVILLE, 21.

To Albert Wilmore, N:—

Mr. Howard was assassinated here last night by some unknown person. Break the sad intelligence to his wife. See you to-morrow morning with remains.

CHAS. A. DURBRIDGE.

26w. D. H. For Operator.

I don't know how much I suffered, nor how long I should have remained there in tears, but for the watchman who came and told me it was very late. I folded the message in my pocket, and went down stairs. The thousand kind acts of Mr. Howard passed through my mind in rapid review. I felt that in losing him I had no ambition left to strive in the world, and how I suffered in that brief time, no one will ever know. Death had never come so near me before. I knew that I was utterly incapable to break it to his wife, but it had to be done, and I went to the house at once. I think I tried to be cautious and careful, but some how or other I did not succeed, for she fell forward in my arms senseless, a stream of blood dripping from her lips. We were unable to restore her to consciousness, and when the physician came she seemed to be dead, for any motion or life there was left. But he was better rewarded, and I left her about half an hour afterward very quiet, and went to the depot to meet Durbridge. I had but a short time to wait, as the train was then due.

Durbridge came off among the first, and I was struck by his peculiar appearance. When he saw me he turned a shade paler, which made him look even more haggard.

'Durbridge,' said I, 'this is very sad and sudden. Can we do nothing about it?'

'Tis,' said he; 'poor Howard, I shall miss him now. I don't know; we must work!'

'You realize now what a friend he was to us?

'Yes: God forgive me for any hard word I may have uttered. He was, indeed, a true friend.'

This was the first time I had ever seen Durbridge in tears. I did not look at the remains, as Durbridge told me that he had been terribly mangled and lacerated. He was buried that evening, his wife accompanying us to the funeral.

II.

It was now several months since Mr. Howard's death, and we were trying to become reconciled. Mrs. Howard had persuaded me to resign and accompany her and my sister to a country seat, which she wished to place in my hands. It was about the middle of the month, and I intended resigning at the end. For some cause or other I was detained very late that night at the office—every one else had left. It was in November, and a very windy, stormy time. I renewed the coal in the grate, and sat there looking into the embers and revolving in my mind the various events which had so rapidly and lately transpired. We had failed to obtain any trace of his murderer, or murderers, and I was beginning to fear that they would never be brought to justice. There was, in fact, a mystery to me about the whole affair, and it was becoming to me more and more inexplicable.

While thus buried in thought I was suddenly interrupted by the clicking of an instrument. It was something unusual at that time of the night, and as we have but little lightning in November, I knew some one was trying to work. I listened closely the second time, and presently I heard the same click again. It was the Avonville instrument. I went over to the table and placed my hand upon the instrument. I turned the adjusting screw up gradually, and at last fixed it so I could hear the sound plainly. I saw at once that the writing came reversed, and tried to remedy it by changing the poles of my battery, but I could not hear it all then. I replaced the wires, and resorted to an old way of mine for getting reversed or bad writing, that is, I put paper on the bar which received the down stroke of the armaton of the sounder, by which means I muffled the down sound and strengthened the return stroke. By close attention I could now hear what was going on, but for the life of me could not tell why the writing came so high.

Presently it began again ; it was a dispatch :

Avonville, 21.

To Albert Wilmore, N :—

Mr. Howard was assassinated near here last night by some unknown person. Break the sad intelligence to his wife. See you to-morrow morning with remains.

Chas. A. Durbridge.

26. D. H. For Operator.

Here followed some twenty or thirty dots. Then he began again, writing very firmly, 'Oh, God forgive me, Howard. I would not have done it but—'

Then, as if speaking to me, he continued, 'Wilmore, I murdered him. If you do not believe me, drag the pond.'

A terrible suspicion passed through my mind. Had Durbridge murdered Howard? If so, why was he writing it on the line? I don't believe I am superstitious, but I did think, what a medium for spirits, if they chose to use it. I waited awhile to see if he would write any more. I then opened the key and called him, but received no answer. I then heard the sounder give one stroke as if some one was cutting out, and although I waited half an hour longer, I heard nothing more.

My nerves, I must admit, were shaken, but I resolved to work out the mystery, and upon the following night returned. At the same time, I again heard the preliminary click ; the same message was sent, and the same disconnected sentences. The next day I went to a detective by the name of Harris. I told him all the circumstances, and asked him to go to Avonville with me. He consented, and we arrived at Avonville that night, about 10 o'clock. I did not intend doing anything until 12 or 1, when I thought we would see who was writing. I knew the position of the office, having been there before. At 12 I went with Harris to the depot, and we stationed ourselves as noiselessly as possible near a window, which opened from the office into a center hall, through which we could plainly see everything in the room. About 1, a light was struck in the bedroom, and presently Durbridge came out. I saw at a glance that he was asleep ; in fact I had suspected as much, knowing him to be something of a somnambulist. He went to his instrument and took five or six blanks from a clip, which he dampened and placed beneath the buttons on his 'cut-out.' This accounted for the high writing. He now took hold of his key, after loosening the spring, and commenced writing with the back end. This was the reason he came reversed. He was doing, in fact, everything he would not have done had he been awake. He then wrote the same message over, and, after replacing it on the file, the same disconnected sentences, which, if true, would utterly damn him. I turned almost deathly sick, and, God knows, I prayed that Durbridge would be found guiltless and my suspicions false. He had now gone back to bed, and we went away.

Harris asked me if I knew where the pond was. I told him, and upon the following morning we were there, with the proper appliances for dragging the bottom. They had not worked two minutes before a suit of clothes was brought up. The blood stains were very visible, but what paralyzed me most was 'C. A. D.' marked upon each piece ; in fact, I had often seen him wear the suit. It is unnecessary for me to continue. When Durbridge was arrested, he confessed everything, and acknowledged the justice of the law.

He was condemned to suffer an ignominious death. I have never gone into a telegraph office since.—*New Orleans Picayune.*

◆

The contract between the French Cable Company and the Franklin Telegraph Company expires July 15th.

TELEGRAPHS UNDERGROUND.

German Objections to Wires Overhead—Plan for Lines Underground.

The Cologne *Gazette*, writing upon the above interesting subject, says :

The storm of the 17th December, 1869, called general attention to the imperfections of the present system of constructing telegraphic lines. While the wires are above ground they are exposed to injury, not only from violent gales of wind, but from innumerable other causes. They may be broken by a sudden change of temperature, and when a frost is severe they are often encased in a crust of ice so thick that they are unable to bear its weight. In the course of from ten to twenty years they are destroyed by rust. The expense of galvanizing them is very great, and it is almost impossible to subject them to the processes with such care as to leave no parts unprotected. The influence of damp frequently causes a loss of the current sufficient to disturb communication, or at least to endanger the exactness of the despatches. Lightning is sometimes attracted, and melts the wires or cleaves the posts. Besides this, it is advisable not to forward telegrams during a thunderstorm, as the life of the official may be endangered by his doing so.

Subterranean lines are exposed to none of these disadvantages. In 1867, several such cables, which had been buried for ten years and more, were carefully examined, and they were found to be in a state of perfect preservation. These considerations would render their general adoption advisable, but as they are far more expensive than those in general use, on account of its being necessary to protect them from the influence of the earth by means of an isolating covering, it will be well to employ them at first only in those districts where several wires are required.

The *Gazette* proposes the following subterranean lines from Berlin :—One to Cologne, with branches to Coblentz, Mayence and Frankfort-on-Main ; one to Frankfort-on-the-Oder, with branches to Breslau, Posen and Thorn ; one via Stettin to Dirschau, with brañches to Dantzig, and via Konigsberg to Insterburg ; one to Dresden, with branches via Halle to Erfurt and Frankfort-on-Main ; one to Hannover, with branches to Holland and Bremen ; one to Hamburg and one to Stralsund. These lines would require 287½ German miles of seven, twenty-six German miles of four and 172 German miles of three-wired cable.

The entire expense of constructing them would amount to about 7,000,000 thalers, but the whole sum need not be laid out at once.

◆

Bangor, Me., February 22, 1870.

To the Editor of the Journal of the Telegraph :

Are repeating offices expected to copy half rate messages *going through* on red blanks, or simply to attach the word "Red" to them? Your last explanation upon the subject seems to refer to the word "Red" only, not to the blank.

Respectfully yours,

"N. C."

Repeating offices are at liberty to use any blank for any message passing beyond them. In the case of half rate messages "going through" the rule is observed by affixing the word "Red"

◆

It has been found by careful examination that the rates for transmission of messages in the United States are lower than in France, Great Britain, Belgium, Switzerland, Germany, Italy or Holland, as indicated by distance, and that notwithstanding the dense populaton of Europe, the telegraph is less used there than here.

◆

The Silvertown cable works, England, have secured the contracts for 2,550 miles of cable for the West India and Panama Telegraph Company, also the cables of the South Pacific Telegraph Company, 1,000 miles to Ecuador, New Grenada and Peru.

◆

Opposition is made by the British Government to the landing of the German-American cable at Sowestoff to connect with the Anglo-American Company at London.

Mode of Securing Telegraph Poles in England.

The pole having been charred in the ordinary manner, when its foot is inserted in the prepared hole, it is surrounded by waste scrap-iron, turnings, and wire clippings. In a gravelly soil the oxidation of the iron results in the conglomeration of the gravel, which thus forms a dense, hard mass that adds greatly to the rigidity of the foundation.—*Technologist.*

◆

The merchants of Glasgow have "denounced the present management."

◆

Conundrum.—Why is a cable operator like the prophet Daniel?

Because he can read the handwriting on the wall.

◆

The old project for a submarine telegraph to Asia has been revived. This time, however, no subsidy has been sought, further than a provision for detailing United States vessels to assist the promotion of the enterprise ; and to this, we suppose, there will be no objection, if the privilege be used in moderation. The establishment of a Pacific cable is, of course, but a question of a very years at the furthest. The two Atlantic lines now working, and the others in prospect, render ocean telegraphy no longer an experiment. However, it is clear that we shall soon have a girdle round the earth.

An Iowa Message.

Here is a message verbatim as left for transmission at an Iowa station:

"Blese zend ol The Bills frour the Gods whas Left."

It has a meaning, no doubt; what is it?

◆

The Wellsville R. R. Reading room for conductors and others now numbers 192 members, and have 500 volumes in their library. W. G. Brownson, Sec. and Treasurer.

◆

March 3.—The Senate Postal Committee, at their meeting to-day, discussed matters in relation to the postal telegraph, and decided not to change the character of the Hubbard bill, reported by the Chairman. The Committee were impressed with the views of Mr. Orton, the President of the Western Union Company, but concluded to let their former report remain without amendment, and so give up the whole question to the Senate, where it can be debated and settled satisfactorily.—*Cor. of N. Y. Tribune.*

◆

We have neglected to acknowledge valuable clippings sent us by Supt. Clowry and others. We do so now with thanks.

◆

The services of all the persons hitherto employed by the telegraph companies in Manchester will be continued by the Post Office. The boys who act as messengers will be provided with a new uniform, grey, with red facings, and the letters "G. P. O." upon the shoulder. The uniforms have been received by the Postmaster, and will be distributed to the messengers in a day or two. Only those in connection with the central office will be provided with uniforms—*Manchester, (Eng.) Guardian.*

◆

The *Phrenological Journal* for March is a very attractive number, and full of its characteristic matter. Everything found in the Journal seems to have an instructive design, and to act as a stimulant to a higher and better life. We commend it to general use. Terms, $3 per annum. S. A. Wells, Publisher, 389 Broadway, N. Y.

The Caton Ottawa Shops.

CHICAGO, March 1st, 1870.

EDITOR JOURNAL OF THE TELEGRAPH:

From what we had always heard about the Caton Instrument Shop previous to its passing into the hands of the Western Union Company and since that time, and from a long experience in using the instruments of the "Caton" stamp, our curiosity had long been aroused to see how the work was done. With this object in view, we devoted a day not long since to making a trip to Ottawa.

It has been often said that the Caton shop "looks like a parlor," that "no expense has been spared in making it perfect," &c., so that our expectations were somewhat extravagant, embracing visions of Brussels' carpets, rosewood benches, frescoed walls and silver-plated files. These expectations began to subside upon seeing a long, plain brick building, only one story high, with nothing to indicate its interesting character except the sign, "Telegraph Instrument Factory," on the top of the roof. The building stands near the track of the Rock Island Railroad, about a half mile from the town. It is one hundred feet long by thirty in width, and was built expressly for the Instrument shop, under the direction of Mr. Henning, the Superintendent, who received *carte blanche* from Judge Caton to build the shop as it ought to be built.

Entering the building at the western end there are two rooms on either side of a passage-way, one of which is used as a store room for raw material, including bases, rubber, stock, and the like, and the other is Mr. Henning's office, from which a window opens into the shop. Passing these rooms we come into the shop itself. The disappointment which we felt in failing to see anything "like a parlor" was more than counterbalanced by what we did see—a well arranged machine shop and large quantities of Caton instruments in all stages of manufacture. It is a mistake to say the shop is like a parlor. Everything looks clean and tidy, to be sure; the walls are white; the tools are well kept, but the workmen without kid gloves shove their files as though they had to earn their living. The room is more like a kitchen than a parlor, but it is more like a machine shop than either. This room contains five insulating machines, used for covering magnet wire. These machines are very simple in their construction, and were all built in the shop. Two additional ones are now being constructed in order to meet the requirements of the shop, as Mr. Henning has a large number of relays only waiting for wire to wind the magnets with. There are eighteen lathes, one planer, one gear cutter, and other tools; for each man an outfit. At the back end of the room is an engine of ten-horse power with its boiler and furnace in a small wing on the north, which supplies the power to carry the machinery. Eight bushels of Illinois coal per day, at a cost of eleven cents per bushel, is sufficient to carry the lathe spindles at a speed of 3,000 turns per minute, besides furnishing steam sufficient to heat the entire building.

One important feature of the establishment is the foundry, which is in a separate building, to the rear of the main one, where all the brass castings are made for the shop. The quality of the metal is so essential to the production of a finely finished instrument that last season Mr. Henning decided it to be a great economy to make his own brass. Accordingly, he employed a first-class moulder, and instead of using old brass scraps, he makes his castings of ingot copper, tin, &c., at a great saving of labor in the manufacture and polish of instruments.

Twenty-eight men are employed in the shop at present, most of whom have been engaged in instrument making in Europe or in this country for many years. There is an impression among the workmen that if a poor job should be brought to the "old man" for his inspection, he would break it in pieces and throw the fragments out of the window.

The Superintendent of the works, Mr. Robert Henning, is, we believe, an Englishman, of perhaps, forty-five years, and is a mechanic by nature and by education, as is sufficiently evident from the fact that he has, with his own hands, made the first samples of all the various instruments that have given such a reputation to the Caton shop. He knows how to *use* the instruments also, having learned to be a Morse operator in order to have a complete telegraph office in his own office.

He is also supplied with one of Varley's Differential Galvanometers for the purpose of testing all his instruments for resistance before sending them out. The relays now furnished have a resistance ranging from 80 to 160 ohms, while the majority of the old ones that come in for repairs, range from 300 up to 600, and some reach even 1,000 and 1,500 ohms. It is easy to calculate how great an improvement must result from this substitution.

The monthly production of instruments is about sixty relays, ten registers, seventy keys, and as many sounders, besides switch boards, cut offs, lightning arresters, and a great deal of repairing.

We saw some registers just finished, the workmanship of which would make a man willing to go back to old times and learn it all over again. Mr. Henning claims that their equal is not found in the United States.

We have never seen any of the instrument shops "East," but after seeing that of the Central Division, it is hard to believe that its outfit or workmen are surpassed by any others in the country. For everything about it seems perfect.

Yours truly,

T.

Position of British Telegraph Securities.

It is very evident that the various classes of telegraph securities are becoming favorites with the public for investment. The fact that the government have paid liberally for the several companies working the inland routes, and for Reuter's Norderney cable, induces an opinion that, at no distant period, they may be tempted to take up the principal, if not the whole, of the submarine lines which may prove permanently remunerative, and also absorb them. The great danger is that the number of projects may be indefinitely multiplied, and that a number of subsidiary schemes may be introduced, which will encumber those already planned, and turn out in a degree competitive. If this should be the case, the strongest efforts should be used to repress them, or only to encourage them to such an extent as they may be really useful. The public, after the experience of the past, will be no doubt cautious enough to avoid doubtful enterprises, or those which on the face of them have not the indelible traces of such organization and healthy and vigorous management. The great majority which have been brought forward possess these features, and hence they have been well subscribed for.

Telegraph shares, as we stated a few weeks ago, are destined to become the new investment. They possess all the elements of success; the science of submarine telegraphy is established; its paying capacity fairly developed; and in the course of the next three years, or sooner, the majority of the cables recently projected will be in active and profitable employment. The proprietors of the several undertakings must, therefore, be true to themselves, and if they would increase the popularity of their investments they, will be wanting in justice to themselves in not attempting to check the speculative variations in their shares, solely produced through the influence of the jobbers in the neighborhood of Capel Court.

The operators at the Stock Exchange, who, it is well known, look with a favorable eye to Telegraph Securities, will, when they are sufficiently depressed, themselves become buyers, and when they have frightened some of the timid and weak holders out of their shares, will be only too desirous of taking and putting them into their own names. It seems really fabulous to hear of the sums that several individuals who were comparatively needy a few years ago, have made by possessing strength of mind and sticking to such securities, have realized. Amounts of £20,000 and £30,000 are small, many names are mentioned which take from the companies now in course of dissolution—their interests having passed to the Government—£100,000 and £200,000 each. It will probably be two, three, perhaps four years, before the present system of telegraphy will be permanently developed, but in that period it will have surely made headway; and then the proprietors will derive due advantage from having supported this class of enterprise, and from having, despite the attempts of the fraternity of adverse jobbers, maintained the value of their securities in its integrity.—*Bullionist.*

◆

AT the regular monthly meeting of the Chamber of Commerce, City of New York, March 3, on motion of Mr. Tonsey, a resolution to memorialize Congress against the adoption of any scheme for the assumption of the telegraphic system of the country by Government, was unanimously adopted.

International Telegraph Conference.

Information, official and unofficial, shows that the proposition of Secretary Fish for an international conference to regulate ocean telegraphs has been assented to by Sweden and Norway, Denmark, Austria, North Germany, Turkey, and Greece. The other Governments have not yet responded.

◆

THE price of R. S. Culley's Handbook of Practical Telegraphy is $5 and not 4$, as erroneously printed in our last.

◆

IT is stated that the directors of the Northeastern Railway of England will establish a telegraph system of their own, with their own wires, and under the superintendence of an electrician whom they will keep upon their staff.

◆

THE discovery of oxygen is generally attributed to Priestley. This celebrated chemist obtained that gas by concentrating solar light on red oxide of mercury (*precipitate per se*), by means of a powerful lens; but oxygen was known, although imperfectly, before Priestley. A learned experimenter worthy the title of chemist, Eck de Sulzback, showed, in the fifteenth century, that metals increase in weight after they have been heated; he calls the metallic oxides "fixed ashes" (November, 1489), and says "this increase of weight is effected by the union of a spirit with the body of the metal, and the proof of it is that artificial cinnabar (red oxide of mercury) when heated releases a spirit." If this learned chemist of olden times had called that *spirit* oxygen, the science of chemistry would have been in advance by two centuries. Cardan speaks, in 1501, of a spirit which feeds flame and Cesalpinus, in the year 1602, says that the dross which covers the surface of lead when melted, comes from the air. At a later time Jean Rey calls attention to the increase of weight which tin sustains when heated in air. Finally, in 1774, we find the capital experiment of Priestley, who extracts from the so-called artificial cinnabar the gas supporting combustion which received the name of oxygen afterwards.

Postal Telegraph.

Mr. Washburn, of Wisconsin, submitted the following resolution, on which he demanded the previous question :

> *Resolved*. That the special committee to which was referred the postal telegraph bill be instructed to inquire into the subject of telegraphing in the United States, and be authorized to send for persons and to examine witnesses.

The House divided ; and there were—ayes 35, noes 68 ; no quorum voting.

The Speaker, under the rule, ordered tellers ; and appointed Mr. Washburn of Wisconsin, and Mr. Holman.

The House again divided ; and the tellers reported —ayes, 41, noes 75.

So the House refused to second the demand for the previous question.

We think this may indicate the fate of the postal bill when it comes to be put on its passage. There appears to us a marked repugnance by the majority of our legislators to the government entering into business on its own account in telegraphs or any thing else. We notice a toot from some congressional economist in favor of government entering into the express business for the conveyance of small packages. It is no use gentlemen. The country only wants governmental protection to every man in attending to his business, and the sooner government consents to be satisfied with this only proper sphere of power the better.

◆

In the Senate—March 7.—Mr. Conkling. I present resolutions of the Chamber of Commerce, of the City of New York, one of which I will read :

> "That, in the opinion of this Chamber, it is unwise for the General Government to undertake the business of transmitting the correspondence of the public, either wholly or in part, by electric telegraph."

With these proceedings I beg to present my approval of them, and to express the hope that the day is far distant when the Government of the United States will embark in the business of telegraphing, I move that these resolutions be referred to the Committee on Post Offices and Post Roads.

The motion was agreed to.

◆

Outside of the committee-room there has been little serious thought in Congress of taking possession of the telegraph lines of the country. A great deal of time and money has been uselessly spent in consideration of the Postal Telegraph bill, and in the interest of economy the further inquiry ought to be stopped, since the late indications on the part of the House. On Monday it refused, by the decisive vote of 75 to 41, to authorize further general investigations of the subject. We hope Mr. Washburne will take the hint and drop the matter. After the recent experience in Great Britain the House has evidently made up its mind.—*Tribune.*

Telegraph Arrangements for Manchester, England.

All the wires have been concentrated at the office in York street, between which and the Head Post-office a pneumatic despatch tube, for the transmission of written messages, has been laid down. At the Post-office a portion of the room now used for the distribution of stamps, and known as the "Stranger's Office," has been set apart for the receipt of the messages. The accommodation is necessarily very limited ; but when it is remembered that, should the public largely avail themselves of the stamped forms, the chief business there will be the handing of documents over the counter, the inconvenience will not be seriously felt. The persons who may have to complain will be those who send casual messages. The writing accommodation which they will require is not very liberally provided for. The best, however, has been done that the limited room at the Post-office will allow. Immediately a written message is handed to the clerk, it will be transmitted through the tube to York street, (a process occupying only seven seconds), and at once placed in the hands of one of the operators for transmission to its destination. A further convenience that the public will enjoy from the stamped form system will be that messages may be dropped into any of the pillar letter boxes, and despatched immediately upon their receipt at the head Post-office. These forms may be obtained at the several telegraph offices, and at every Post-office where money order business is transacted.

Note.—It seems to us that it would require a vast amount of self-sacrificing loyalty to regard the above postal telegraph arrangements for so important a city as Manchester, as anything short of an unmitigated nuisance.

The Privileges of Stockholders.

Two gentlemen were chatting on the Boulevard ; one was a great speculator, developing the plan of a magnificent project ; the other a dazzled capitalist, ready to snap at the bait. He hesitated a little, but was just yielding, merely making a few objections for conscience sake. Near these two paused a couple of youngsters of twelve years. They were looking into a tobacco shop close by, and one cried out to the other :

"By the piper ! I'd like to smoke a sou's worth of tobacco."

"Well," said the other, "buy a sou's worth."

"Ah ! as luck will have it, I haven't the sou."

"Hold on ! I've got two sous."

"That's the ticket ! just the thing ; one for the pipe and one for the tobacco."

"Oh, yes ; but what am I to do?"

"You? Oh ! you shall be stockholder ; you can spit."

It was a flash of light. The capitalist thrust his hands into his pockets and fled. The speculator cast a furious look at the urchins, and turned down the street.

◆

Editor Journal :—

Please state how many words there are in "South Carolina," "New England," "United States"?

R.

When these signify respectively the State of South Carolina, the States known as New England and the United States, the two words composing each name are counted as one. But when used in cypher, or in part of the name of a bond or hotel or stock, each word is counted separately. Thus :

He lives in South Carolina.	4 words.
He owns New England securities.	5 words.
United States Bonds are worth par.	6 words.

Such is the present rule. It is designed, we believe, to change this order, and count every word without reference to their use or connection so as to simplify interpretation.

The answer we gave a few weeks ago in reference to the words "pig iron," was given from the practice in the New York office, where they are counted as two words. According to the rule they are only one, as they are found in the dictionary connected by a hyphen as one word. This rule we believe correct and the practice here wrong.

International Telegraphy.

Mr. Fenton introduced a bill to regulate international correspondence by telegraphic lines between the United States and foreign countries.

It provides the following rules shall govern all Telegraph lines now or hereafter established between the United States and any foreign territory ; All persons shall have the right to correspond by means of the international telegraph ; the United States Government shall enjoy the same rights and privileges regarding the use and control of said lines as are granted foreign Governments ; the United States shall have free use of all such lines for thirty minutes in every twenty-four hours ; no Government shall use the lines more than one hour at a time if another Government desires to send a message ; the lines shall be kept open to the public at all times for the transmission of messages ; all messages shall be forwarded in order of reception, except that dispatches of the United States Government, and of foreign Governments conceding the same privileges, shall be given priority ; the United States Government reserves the right to stop the transmission of dispatches dangerous to the security of the State and contrary to law and morals on giving due notice to the Telegraphic Bureau where they originated, and also the right to suspend the service of the international telegraphs for an unlimited time, if it judges necessary, either in a general manner or for certain kinds of correspondence ; violations of secrecy shall subject the employes of companies to fines and imprisonment, the fines, if necessary, to be collected from the companies ; the destruction or injury of such lines within the jurisdiction of the United States shall constitute piracy, and be punished accordingly ; the rates of compensation for messages by such lines shall be fixed by the postal authorities of the United States and to countries connected by them, together with the owners of the cable ; the consolidation of two or more such companies, without the consent of the Postmaster-General of the United States, is forbidden ; and in case of combinations, that officer, in the absence of an International Convention regulating the matter, shall determine the rates to be charged. The consent of Congress is given to laying and maintaining such cables subject to foregoing stipulation, and to State jurisdiction, provided similar privileges are granted by the respective foreign countries where they terminate; but this provision shall not apply to the cable recently landed in Massachusetts. No international telegraph company shall make any contract with any other telegraph company for the purpose of reserving to itself a monopoly of the messages between the United States and Europe; and no company which shall have made such an agreement shall be allowed to transmit messages from the shores of the United States until such contract is annulled.

Referred to the Committee on Foreign Relations.

Amalgamating Iron.

We gather the following process for the amalgamation of iron from The Technologist a new monthly of much merit. The use of Iron may become an important element in battery power, and it is well to know how to utilize it.

The iron is first well cleaned with hydrocloric acid, and then plunged into a very dilute solution of sulphate of copper mixed with a little hydrocloric acid. It immediately becomes thinly coated with metallic copper, which copper must be removed by means of a brush, friction with paper, and washing. The iron is then placed in a very dilute solution of bichloride of mercury also mixed with a little free hydrochloric acid. It becomes perfectly coated with a layer of mercury which cannot be removed by friction with rough bodies.

Action of Magnetism on Various Gases.

M. Treve has communicated to the French Academy some remarkable results of experiments upon the action of magnetism upon the various gases. When the spark from an induction coil passes through a Geissler tube filled with hydrogen the gas becomes luminous, having a blue tint, plainly violet at the extremities of the tube, and of a fine red color in a capillary prolongation. But upon placing the latter part of the apparatus between the poles of a magnet the red instantly disappeared, giving place to a perfectly white light. In like manner oxygen, which gives a milky white light in the capillary tube, became red ; nitrogen deepened its blue to a still deeper blue ; the brilliant white of carbonic acid became deep blue ; the blue of silicium fluoride became a bluish violet. The spectra of these luminous tubes changed when the capillary portions were subjected to the action of magnetism.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

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Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, MARH 15, 1870.

A Needed Example.

Two things are essential to all who would excel in the telegraphic art. The one is a clear, simple chirography; the other an accurate manipulation of the key. These are the practical points which affect the business, and by which its status is largely determined. Carelessness in any department of labor is so infectious that it enters into and demoralizes all related labor, and is the great enemy of all attempts at excellence. We believe that the genuine success of any man's life depends not only on his devotion to the work assigned him or which he assumes, but to the care and singleness of purpose with which he pursues it. This is just as true even in the performance of those common duties, which, because they do not seem to command attention, and are constantly recurring and familiar, do not always excite our care, and yet link themselves to and are identified with the whole results of life.

In the very nature of things, the operators at large offices, especially those working way wires, must be examples to the operators at small offices whom they can influence, both by their manners and their work. If the key of a large office is manipulated carelessly, it cannot be expected that the way office will seek a higher style. The evil is shown in this pernicious result, that the idea is formed that any kind of writing which can be understood, will do. Excellence, is not even desired. And so it happens that on some sections of line a miserable, irregular, deceptive system of writing exists, the cause of frequent error, and of a shiftless and careless performance of the whole service. This whole thing needs correcting. It can be done by good example more effectually than any other. Let there be conscience in the mechanical accuracy of the manipulation of the key by the operators in large offices, the spaces all regular, the dots and dashes carefully related to each other, and the whole action of the hand denoting care, and the service of way offices will rise at once. The mind instinctively observes and imitates such processes, and there is born a desire for excellence by simply seeing it.

Of course some growler will say "What use is it? It won't bring me in any more." Won't it? There is just the error of men's lives, the source and cause of inefficiency and poverty. Why, some men have made their fortunes just because some humble duty has been done well, and the sharp eye of some discerning man has seen it. We have examples of this near us, and meet them every day. A neat, clear chirography, a well executed task, a shoe well blacked, a face well washed, an errand intelligently executed, are the stepping stones to higher duties and ampler compensations.

So we ask for a more conscientious example by all experts in every detail of duty. Let your manuscript be simple, neat, and clean; your manipulation exact, your forbearance constant, your kindness and temper undisturbed, and your example will be strong, compensating and fruitful.

Craig's Automatic Telegraph.

In another characteristic letter to the New York *Herald* Mr. Craig, who is nothing unless abusive, and yet whose piquancy is always amusing, gives us the benefit of all the adjectives Mr. Ashley has left. Not only that, but we are represented as the poke stick of others, and our admissions of excellence of certain features of the old system he has brushed up to accomplish his revenges and make money, represented as the result of recent inspirations. Mr. Craig can find reference to these systems in our pages long before he dreamed of a line to Washington, and to automatic machinery far more advanced than his own, of the work of which we have long had the personal proof and knowledge.

One curious perversion of language is eminently Craigian and unique. The statement was made that "in European offices Wheatstone's automatic and Hughes' type printing instrument will be in use at none but offices of the first class." Any sensible man, at least any one at all acquainted with telegraphic matters, would see by this statement that these two instruments were not adapted for general use, and had their sphere only at large offices—as we said of the automatic process in a recent number of the *Journal*. But Mr. Craig, seeing the connection between automatic machinery and "first class" offices, adroitly claims that automatic machinery is held *in first class estimation!* If Mr. Craig will go to London he will find that what we stated is the simple truth; that the automatic system, so long in use there and on the continent, and which all who have read telegraphic history knows, has no other sphere than in large offices, where it is utilized during the accumulations of business at certain hours. Even with respect to a much superior process of automatic telegraphing in Europe, we have Viscount D'Vougy's letter dated in 1868, stating that although its operations were beautiful, its use by the public was very limited.

Mr. Craig cannot see the force of the argument that the forming of a letter, at a distant station, by the simple depression of a key, the simplest act possible either to finger or machinery, is better than an act equally simple which only prepares it for transmission. It is, no doubt, hazy to him, although it must be luminous enough bye and bye. Equally hazy must this application be to the Morse system, which responds at any distance to any rate of manipulation of which the finger is capable, has an average of three manipulations for each letter, but is complete in all its necessary processes when these are once made. We can afford to grant that the automatic machinery will not cost a dollar each, that it can transmit 1,000 words a minute or even 2,000; that a boy can attend the transmitter, and that a girl can perforate the paper as fast as she could transmit a Morse message, and yet it remains true that the message has to be

1st. Punched, taking as long to do it as to send altogether by the ordinary process.

2d. Examined, requiring an equal time.

3d. Transmitted.

4th. Copied from strips of paper from the lips of a reader.

processes which involve time, and labor, and risk in which we fail to find anything specially meritorious. The gun shoots fast enough but takes too long to load, and after it has shot, has done nothing until a hole is made to show where it hit.

Telegrapher's Mutual Insurance.

During the last month there have been a number of new applications for admission to the membership of the association, the last certificate being 787. This number does not represent the actual membership, as both the number of the dead and those who have withdrawn or tired of the service have to be deducted. We are safe in placing the actual membership at 650, and from appearances it will soon reach 750 or even 1000 members.

As the organization increases in numbers, questions arise as to the necessity of its limitation both as to members and the amount paid. Some favor a regular payment to families of deceased members of five hundred dollars net. With a membership of 1,000, under such a rule, one assessment would pay for two deaths, make payments easy, and accomplish the objects of the Association. Others would limit the membership to 500 or 1,000, others still to a limited area of States, and with more restriction as to the insured. We prefer it to include the entire craft, and, if we had our choice, would insure any man who had strength enough left to put his finger on a key. Yes, we would insure him if he could n't wag his little finger and was laying his worn head on the bosom of death. But we would be glad of the views of members on all these points, so that the Committee may be intelligently guided in their work and be able to propose changes, if any, which will meet most enlarged acceptance.

A PROJECT is on foot for laying a new transatlantic cable which is to be smaller and lighter than any heretofore used. Its cost is estimated at £250,000. Another scheme is on foot for an exclusively British cable to connect Great Britain and her colonies. In fact Great Britain is passing through a telegraphic mania, the sale of lines to Government at a price three times their cost or capital having stimulated speculation, and sprung many new schemes into existence.

KITE flying is to be prohibited in New York, so as to prevent injury to the new fire alarm telegraph now going into operation. It will will not be many years before not a pole will be visible in New York, as the pneumatic tubes now begun will give an opportunity for carrying the wires by cables to the suburbs. This will be a great relief.

THE price of Culley's Hand Book is $5. D. Van Nostrand, Publisher, 23 Murray street, N. Y.

VENTILATION!

A THREATENING. BLOW.

What with Hubbard and the Herald, two Washburns and a Congressional Committee all in full blare, the situation of the Western Union Company is, to say the least, *breezy*. But when to this formidable array of wind instruments, including Craig's little whistle, it is proposed to add a *Ventilator!* the prospect becomes absolutely alarming.

We print the following correspondence by way of warning our friends to prepare for a new *blow* from a new instrument by a new hand at the bellows.

NATIONAL TELEGRAPHIC UNION,
NEW YORK, Feb. 26th, 1870.

WM. ORTON, ESQ., PRESIDENT W. U .T. Co.,

SIR:—The enmity and animosity of some of the officers of the Western Union Company toward the organ of the National Telegraphic Union, *The Telegrapher*, is so great, that very extraordinary means are being resorted to for the purpose of destroying it, if possible. Among other measures resorted to for that purpose is the circulation of papers in the offices of your Company which operators are required to sign, under a threat expressed or implied, of dismissal as a consequence of refusal, agreeing to discontinue and discountenance the paper.

I have never asked any favors of your Company and do not propose to do so now, but it has seemed to me that the Executive of the Company could not be aware of this attempt to regulate the literary inclinations of its employees.

I propose to ventilate the matter and bring it to the attention of Mr. Washburne's Committee and the Postal Committee of the Senate, but do not wish to do you injustice, and would be obliged if you would favor me with a reply stating whether this most extraordinary step is sanctioned by you or the Executive Committee of the Company.

An early reply would greatly oblige

Yours very respectfully,
(Signed) J. N. ASHLEY,
Publisher and Editor of *The Telegrapher*.

THE REPLY.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 BROADWAY, NEW YORK.
March 2d, 1870.

J. N. ASHLEY, ESQ., PUBLISHER AND EDITOR OF THE TELEGRAPHER, N. Y.

SIR:—I find your note of February 26th on returning to my office after a few days absence at Washington. You state in substance that papers are being circulated in the offices of this Company agreeing to discontinue and discountenance *The Telegrapher*, and that operators are required to sign such papers under threats of dismissal, and you ask whether this proceeding is sanctioned by me or by the Executive Committee of this Company. You also state that you propose to ventilate the matter, and bring it to the attention of Mr. Washburne's Committee and the Postal Committee of the Senate.

In reply I have to say: That your note conveys the only information of the proceedings to which it relates that has reached me; and until some person in our employ, feeling aggrieved by such a proceeding, appeals to me, I do not feel called upon to take any action or to express any opinion in the premises. An examination of *The Telegrapher* from the time the late strike was inaugurated down to the present, satisfies me that its efforts have been and are being directed, to the extent of its limited power, to the injury of this Company, and to the encouragement and support of our rivals. It does not surprise me, therefore, to learn that some of our employees, disapproving the course of *The Telegrapher*, decline to encourage its circulation. They have the same right to discard it, as I concede they have to purchase and read it. I do not propose to make its "discontinuance and discountenance" a test of competency for our service. Yet, any special effort to promote its circulation by any of our employees would incline me to the belief that the parties engaged therein were more in sympathy with the views and policy of our enemies than with our own.

I await with some curiosity, but without anxiety, your proposed ventilation, and especially that part of it which refers to Congressional Committees. If you can succeed in convincing them that this matter demands Governmental intervention, you will, no doubt, be able to secure Congressional legislation ample for the redress of your grievances.

Very respectfully,
(Signed) WM. ORTON,
President.

◆

WE are indebted to a strike in the office of our printer, growing out of a demand for certain unusual wages on Washington's Birth-day, for the setting up of almost every line of the present number of the JOURNAL by a Lady. We bear testimony to the rapidity and unusual correctness of her work, the proofs sent us being absolutely without error. Full men's wages are given her, and we congratulate ourselves on the reduction of care which her ability and correctness has secured to us.

◆

Postal Telegraphs and the Press.

LONDON, March 7, 1870.

A meeting of the representatives of the press associations has been summoned to consider what action is required of the public journals in consequence of the continued mismanagement of the telegraphic service by the postal authorities.

◆

Western Union Telegraph Company.

OFFICIAL STATEMENT.

	Jan. 1870.	Jan. 1869.
Gross receipts	$543,938 69	$606,051 90
Expenses	408,031 08	349,578 70
	$135,907 61	$256,473 20

The above statement is the exhibit of an extraordinary month, during one half of which the business of the main routes was seriously embarassed by the operator's strike. The reduction in receipts, however, from this source is not so large as was expected, nearly a quarter of which being the result of the adoption of a tariff in October last nearly 25 per cent. less than the previous year, although in spite of the strike and the embarassments attending it, 225,000 more messages have been delivered during the present January than in that of 1869. Of the expenses, although to a superficial enquiry it may have been thought that the strike would reduce the aggregate, yet from $12,000 to $15,000 are attributable to that cause. The balance of difference in the expenses of 1870 compared with 1869, represents the cost of sending the 225,000 messages received in excess of the preceding year, or about 55 per cent of the receipts from that source.

TARIFF BUREAU.

Semi-Monthly Circular.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
MARCH 16, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since March 1st, the date of the last tariff order. Please note them in your tariff book:

NEW OFFICES.

96 Blacks and Whites, Va
* Eureka Coal Mines, Ga
Fredericton Jn., N B Tariff same as Fredericton, N B
* Hinsdale, N H
25 Holliston, Mass
289 Kentland, Ind—re-opened
351 Lamar, Miss
418 Laclede, Mo
437 Missouri City, Mo—re-op'nd
* Morganville, Ga
* Newton, Ala
159 New Galilee, Pa
455 Percival, Iowa
40 Shaker Village, Mass
429 Springfield, Mo
* Trenton, Ga
* Terminus Ala
* White Oaks, Pa
* Wauhatchie, Tenn
Westfield, N B. Tariff same as Fredericton, N B
* Winchester, N H
* West Swanzey, N H
369 Webster, Mo
369 Wright's City, Mo

NEW OFFICES ON OTHER LINES.

Eureka Coal M'nes, Ga	40	3	Chattanoogo, Tenn
Hinsdale, N H	25 35	2 2	Keene, N H Nashua, N H
Morganville, Ga	25	2	Chattanooga, Tenn
Newton, Ala	65	6	" "
Trenton, Ga	30	2	" "
Terminus, Ala	75	7	" "
White Oaks, Pa	20	1	Oil City, Pa
Wauhatchie, Tenn	25	2	Chattanooga, Tenn
Winchester, N H	25 35	2 2	Keene, N H Nashua, N H
West Swanzey, N H	25 35	2 2	Keene, N H Nashua, N H

Business for Hinsdale, Winchester and West Swanzey, N. H., should be sent and checked via the cheaper of the two routes given above.

OFFICES CLOSED.

Point of Rocks, Md., Lone Oak, Ark., Valley Junction, O. and South Pass, Wy.

GENERAL INFORMATION.

Business for Somerset and Myricksville, Mass., in Square 13, will hereafter be sent and checked to Fall River, Mass.

Business for Farmington, Conn., hereafter will be sent and checked to Plainville, Conn. Tariff for other lines unchanged, and Cyclsco, Nev. and Rockland, Nev., in list of offices between San Francisco, Cal., and Omaha, Neb., in last JOURNAL, should read Cisco, Cal. and Rocklin, Cal.

WILLIAM ORTON,
President.

◆

MARCH 3.—In Congress. The report and bill relative to inter-oceanic telegraphing, submitted to the House of Representatives to-day, were ordered to be printed. The report gives a history of all ocean cables connected with this country. The bill is designed to regulate such cables based on the principle of reciprocity; their neutrality not to be affected by war; this end to be secured by treaty with foreign powers. It is officially known here that the French Government is willing to withdraw the monopoly of 20 years given to the French Cable Company, and give Americans the same privilege.

Telegraphers' Mutual Life Insurance Association

ASSESSMENT NO. 11

Charles Beardsley,
John C. Gregg,
Giles Williams,
Geo. Chivvis
Richard O'Brien,
C. F. Loomis,
A. W. Haygood,
Edwin Evarts,
J. W. Crouse,
Philip Degen,
William Blanchard,
Charles Alston Smith,
J. H. Presley,
Chapin Cole,
W. E. Seward,
J. S Fitch,
N. H. Brown,
Thomas R. Knox,
J. W. Kelly,
E. F. Ludwig,
D. J. Ludwi',
I. T Heenan,
John J. Heenan,
Thomas F. Heenan,
James W. Smith,
James R. Heenan,
John H. Van Every
Charles S Snyder,
Thomas Dolan,
A. S. Brown,
M. H. Bacon,
A. E. Lang,
I. H. Rugg,
A. H. Seymour,
W. W. Thweat,
R. Thompson,
Waldo H. Collins,
Will. S Clark,
Libbie Fryer,
W. W. Smith,
J. W. Sherwood,
C. A. Jones,
J. F. Hare,
C E. Clark,
W. T. King,
J. F. Collins,
W. D. Peck,
H. L. Waterbury,
G. C. Thompson,
E. R. Willerton,
E. S. Keep,
C. E. Myers,
M. H. Redding,
F. C. Gay,
A. S. Farwell,
James Hough,
Ira Dewitt,
James Rowe,
I. B. Collins,
C. A. W. briggs,
A. J. Locke,
A. R. Phillips,
Samuel Moore,
Isaac Ford,
A. W. Crissey,
J. J. Harrigan,
W. C. Buell,
C. S. Follett,
F. D. Adams,
F. J. Nicholson,
B. F. Follett,
W. H. Ashby,
Andrew Clark,
James Murray,
Leonidas Daniels,
P. Calahan,
J. A. Oure,
Jos. L. Edwards,
John E. Ash,
Sophia Rogers,
J. H. Cade,
H. J. Fische.

L. G. TILLOTSON & Co., 11 Dey street, New York, manufacture the machinery of the Automatic Fire Alarm Company of which S. D. Cushman is the electrician.

J. F. SKIDMORE, formerly of Brockport and Albion offices, is now at San Mateo, California, and writes: "I have been in the place eight years; am Agent of the W. U. Telegraph Company, Justice of the Peace, Notary Public, Post Master, Town Clerk, Insurance and Real Estate Agent, and doing a general merchandise business!" We think that is about enough for one man in this busy world. Now he wants to be insured. That shows his wisdom. He adds: "I weigh 165 lbs., and am a married man." You may pass.

Our friend, Thomas B. A. David, late Superintendent of the 8th district, W. U. T., is now the General Agent of the Crescent Spring Company of Pittsburgh, Pa., and is prosecuting his new duties with much success.

Born.

Feb. 4th, at Winchendon, Mass., to Mrs. R., wife of L. E. Bathrick, Operator W. U. Tel., ofs, a daughter, 8 pounds.

Married.

At Tunbridge, Vt., March 3d, by Rev. Mr. Morris, Charles C. King, of W. U. T. Co., Albany, to Miss Lulu J. Lyman, daughter of William B. Lyman, Esq.

FISHER—HAWLEY. On Thursday, March 10th, at Kewanee, Ill., by Rev. G. W. Arnold, William A. Fisher, Manager Western Union Telegraph Office, Kewanee, Ill., to Miss Amanda E. Hawley of Cambridge, Ill.

On the 10th inst., at the residence of the bride's father, by the Rev. J. A. Edie, assisted by Rev. Dr. Ross, Mr. O. L. Newton, manager W. U. Telegraph Office, Clayton, Ill., to Miss Lizzie E. Clark, all of Clayton.

Death of an Old Operator.

We regret to announce the death of Charles D. Smith, of Summit, Illinois, by apoplexy, in Chicago, March 3d. Mr. Smith was one of the earliest operators in the State. He was a member of the Telegrapher's Mutual Insurance Association.

NOT LOST WHEN SAFE IN HEAVEN.

It is a lovely morning, and the sun
Shines in my room, gilding old picture frames,
Making the dull red in the carpet crimson;
Even the walnut crib is brightened with its beams,
But there's no gold upon the tiny pillow,
No sunshine in my heart this sad, sad day,
And all the brightness seems a mockery;
For the fair baby head, that used to rest
Upon my shoulder, and gild the pillow
With rare golden hair, as sunshine cannot,
Will never rest in either place again.
It seems so strange to sit with folded hands,
Knowing that baby will not wake up soon,
And cry to come to me. For many days
And nights I have watched over him; but why
Do I now sit so near the little crib?
He would not miss me if I went away
And staid all day. My kind friends pitied me
When I spent the hours bending over him,
And said I surely would be worn out soon,
And now—only to have him in that crib
Again, I would watch months of nights, God knows
How willingly!

My little girls came to
My room, looking so grave, and so very still,
And sometimes raise their eyes to mine as though
They understood a mother's agony,
Then softly steal down stairs, and wonder there
If it is very wrong for them to smile.
I push aside the curtain, and look out
To see a nurse in a house opposite
Holding a little baby in her arms,
Not like my little one. His eyes were dark
And deep, grand eyes, so even strangers said,
This baby's blue ones gaze out on the street,
Without expression, and seem half washed out;
But now the mother comes, and the child springs
Into her arms, and its pale eyes light up,
And the soft baby-cheek is pressed to hers.
As though questioning the mother who grows grave.
I cannot hear her words; but know she says,
Clasping her baby closer in her arms,
"That lady opposite has lost her child,
An only son." And then they pity me,
And may be talk about my child's great beauty.
I cannot longer look; hot, scorching tears
Blind me to all outside my own sad room.
My head sinks in my hands, God only knows
The anguish of that moment; but He knows;
For soon I seem to hear a voice
Loving and sweet, speak to my breaking heart,
And tenderly reproving, say to me
"Is thy child LOST, when thou canst go to him?
Are jewels LOST, when stored away with care
Beyond the reach of thieves? Are treasures LOST,
When safely kept from all corruption?
Is thy child LOST in heaven?"

Now a smile
Like the first sun-ray comes into my eyes,
Eyes, so unused to aught save tears; and joy
Springs up within my heart, my poor, sad heart,
But 'tis so sweet to feel I have not LOST
My little one, my precious, only son,
And that I NE'ER CAN LOSE HIM. Once again
I look across the street, the blue-eyed child
Still laughs and crows, he is so full of life.
His mother has him yet; but can she say
That he is hers forever, as I can?
In years to come her only son may stray
From the bright path which leads up to the skies,
The path my baby's little feet have trod,
And close beside the empty crib I kneel
So to pray she ne'er may lose her little one;
And then I beg the dear Lord Christ to help
My husband, and my little girls and me,
To believe and love, that we at last
May dwell with Him: and pray that Heaven now
May seem much nearer us, since baby's there,
May seem more like our Home than does this Earth
With all its sin and sorrow

Then I call
My little girls around me, and try hard
To talk of Heaven as our happy Home,
Tears come sometimes, and stop me for awhile,
But as I end, my little Annie clasps
Her arms around my neck, and gently says,
"When people ask us if we have a brother,
We won't say no, mamma, that would be wrong:
We'll say God keeps him for us up in Heaven,
And that we'll all go see him by and by."
Then the three little faces, growing bright,
Press close to mine, and kisses true and sweet
Cover my brow and lips—my burning brow—
And I feel happier than I have done
Since baby left us.

THE proofs are constantly appearing that while it is evident that in due course of time the public will become so educated to the use of the telegraph that a greatly enlarged use of it will follow; it is equally clear that in advance of this education no corresponding increase of its use will attend every reduction of rates. Both processes must go together. The provision of wires must meet public demands, and the decrease of rates depend upon the facility for a larger performance without corresponding increase of expenses.

FORGIVENESS.—A soldier, whose regiment lay in a garrison town in England, was about to be brought before his commanding officer for some offense. He was an old offender, and had been often punished. "Here he is again (said the officer, on his name being mentioned) flogging—disgrace—solitary confinement—everything—has been tried with him." Whereupon the sergeant stepped forward, and apologizing for the liberty he took, said: "There is one thing which has never been done with him yet, sir." "What is that?" said the officer. "Well, sir," said the sergeant, "he has never been forgiven." "Forgiven!" exclaimed the colonel, surprised at the suggestion. He reflected for a few minutes, ordered the culprit to be brought in, and asked him what he had to say to the charge? "Nothing, sir," was his reply, "only I'm sorry for what I have done." Turning a kind and pitiful look on the man, who expected nothing else than that his punishment would be increased with the repetition of his offense, the colonel addressed him, saying: "Well, we have tried everything with you, and now we are resolved to—forgive you!" The soldier was struck dumb with amazement! The tears started in his eyes, and he wept like a child. He was humbled to the dust; and thanking his officer, he retired.—To be the old, refractory, incorrigible man? No! from that day forward, he was a new man. He who told us the story had him for years under his eye, and a better conducted man never wore the Queen's colors. In him kindness bent one whom harshness could not break. The man was conquered by mercy, and melted by love.

Have you to do with one with whom you have tried every kind of punishment in vain? The next time you are going to strike the blow, stay your hand and say, "Well, I have tried everything with you; now I have resolved to forgive you."—*Aldine Press.*

ART OF MAKING MEN HAPPY.—There is an art in making a man happy which very few understand. It is not always by putting the hand in the pocket that we remove afflictions; there must be something more. There must be advice, and labor, and activity; we must bestir ourselves, leave our arm-chairs, throw off our slippers, and go abroad, if we would effectually serve our fellow-creatures. When to this active and effectual benevolence the more prompt efficacy of money is added, how great and how lasting may not the good be! Few, however, possess this quality of philanthropy; for it costs *less* to give five dollars than to give an hour.—*Aldine Press.*

Journal of the Telegraph.

The New York Fire Alarm Telegraph is practically completed. It has been built and engineered by the Brothers Chester. Need we say more. The system is Gamewells. The wire is the American Compound Wire, made with greater reference to endurance than as at first prepared. This wire, from its great strength and lightness, gives a graceful look to the structure, and permits long stretches without intermediate support. The core is steel, the sheath copper, and it has a further protection in an outer covering of tin. We have noted the care bestowed in its preparation. As a conductor, it stands the best, and lightest and strongest in use.

◆

Robert C. Loomis, telegraph operator at Pass a Loutre, La., was drowned near that place on Wednesday, March 2, by the upsetting of a boat.

◆

A Demoralized Correspondent.

Mr. Editor.—Have you—whose duty it is to chronicle anything interesting pertaining to electricity or the working of the Telegraph—retained the following information to give the electricians a chance to study into the matter before venturing an explanation? Has not sufficient time already elapsed to hear of this through your columns—or are instances like this of so common occurrence there that you don't consider it worth while to mention it?

Chicago, Ill.

DEMORALIZATION OF TELEGRAPHIC INSTRUMENTS.

"One interesting fact connected with the gold collapse has never been published. When the price began to decline from 160, the telegraphic instruments employed here for distributing quotations all over the city could not make revolutions with sufficient rapidity to keep up with the fall in price. In endeavoring to do so the batteries and instruments were put to such a strain that days elapsed before they could be again employed. Like the gold gamblers themselves, they were completely demoralized by the terrific strain on their energies, and required days for recuperation."

The above is from the correspondence of the Chicago Evening Journal. What a strain there must have been on that man's imagination. We scarcely wonder at it. We were among the crowd of 500 excited men who watched the large drum on which the quotations were marked as it rolled backwards and forwards as gold went up or down. Its silent announcements as the crowd swayed back and forward, broken by the yells inside, were of the most exciting kind, the effect of which has scarcely yet passed away. But it was the brain, not the machine, which was demoralized. The correspondent must have bought as the drum showed the wild figures of the war, 162, and in the subsequent demoralization of his pocket still sees in the darkness of his dreams, that quiet drum still revolving, and hears a yell inside of "going163¼."

FRANK L. POPE,
TELEGRAPHIC AND ELECTRICAL ENGINEER,
Nos. 78 and 80 Broadway, Room 48,
NEW YORK.

AMERICAN FIRE ALARM
AND
POLICE TELEGRAPH.
GAMEWELL & CO., PROPRIETORS,
NO. 104 CENTRE STREET, NEW YORK.

This system of Fire Alarm Telegraph, with a central office, or upon the
AUTOMATIC PLAN,
is now in operation in the following cities, to which reference is made for evidence of its great SUPERIORITY AND VALUE, and UNIFORM reliability:

BOSTON,
CHICAGO,
PHILADELPHIA,
CINCINNATI,
ST. LOUIS,
BUFFALO,
BALTIMORE,
MOBILE,
NEW ORLEANS,
PITTSBURG,
LOUISVILLE,
ALLEGHENY,
MONTREAL,
QUEBEC,
PORTLAND,
ST. JOHN, N. B.,
HARTFORD,
TROY,
NEW HAVEN,
ROCHESTER,
SPRINGFIELD,
TOLEDO,
ALBANY,
COLUMBUS,
LAWRENCE,
MILWAUKEE,
SAN FRANCISCO,
CAMBRIDGE,
WASHINGTON, D. C.

The distinctive features of
THE AMERICAN FIRE ALARM TELEGRAPH
are a Combination of Circuits, the Automatic Signal Boxes, Electro-Mechanical Bell and Gong Strikers.

THE AMERICAN FIRE ALARM AND POLICE TELEGRAPH is covered by some twenty patents. Very early after its introduction into Boston, Gamewell & Co. purchased the original patents of Farmer & Channing, and during the past fifteen years have spared no expense or pains to improve and perfect this system.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

Bureau of Storms.

Our readers will remember the reference we recently made to the proposition of a correspondent of the Chicago *Bureau*, to establish a system of meteorological observations, with a view to the notification of the approach and force of storms. The same correspondent (Professor Lapham) now urges the importance of this project in a convincing communication. In connection with his letter is published a map which shows clearly the origin and progress of the great storm of March 14–17, 1859, and demonstrates to any observer that it might have been known on the lakes a whole day before it reached them. The question is, whether as a matter of commercial economy and security,—to say nothing of scientific inquiry on the one hand, and humanity in the saving of life on the other—we ought not to establish the kind of observatories called for by the *Bureau*. During the single storm of the 16th and 19th November seventy lives were lost on the lakes, besides thirty-seven vessels of various tonnage, making a total of 10,942 tons of shipping, valued at nearly half a million dollars. Sixty-two other vessels of various classes were lost in the same storm. Adding the values of cargoes lost or damaged, we have a total loss of at least two millions of dollars. It is at least clear, as the *Bureau* says, that five per cent of this might have been saved by timely notice. And what is true of this single storm must be multiplied by all the storms of a year.—*N. Y. Times.*

A HAND-BOOK OF PRACTICAL TELEGRAPHY.
By R. S. CULLEY,
Engineer to the Electric and International Telegraph Company.

Published with the sanction of the Chairman and Directors of the Electric and International Telegraph Company, and adopted by the Department of Telegraphs for India.

FOURTH EDITION
REVISED AND ENLARGED.
1 vol. 8vo, cloth, $5.00.

HISTORY AND PROGRESS OF THE ELECTRIC TELEGRAPH,
WITH DESCRIPTIONS OF SOME OF THE APPARATUS.
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III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and the payment of dues

XI. A meeting for the election of officers shall be held annually during the first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written request of twenty-five members

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

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3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

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A Musical Fish.

One day, as I was returning to Tallahassee, from a hunting excursion in Florida, we were rowing along by the shore, about sunset, when suddenly a strange, grave and prolonged sound struck my ear. At first I thought it must be a drone, or fly of extraordinary magnitude; but seeing nothing, I questioned my guide as to what it could be. "Oh, massa," replied he, "dat is de fish what sings. Some call it siren, or mermaid fish, and others musico." A little way on, we heard a greater chorus of these strange voices, reminding me faintly of the music of church organs. I stopped the canoe, the better to study this strange phenomenon; when, at my request, my able oarsman threw a net into the water, and soon laid at the bottom of the boat about a score of little fish, each about 10 inches long, resembling the gray mullet very much in outward form. "Dese be mermaids, massa," said the negro, "but, in de name ob hebben, don't eat dem." "Why not?" quoth I. "Because dey hab de lub poison." "Lub poison! And pray what's that?" "Yes, massa, when you eat one of dese fish you fall so deep in lub you can never get out again." I tried to laugh my black friend out of his notion, but in vain. In spite of what he said, however, I had my musicos fried that evening, and found, as I expected, that I was none the worse for the experiment. The musician fish is white, with a few blue spots near the belly. It is about sunset when these fish begin to sing, and they continue their music during the night, imitating the grave and sonorous droning of an organ, just as it reaches your ear when you stand outside a church.—*Notes in Florida.*

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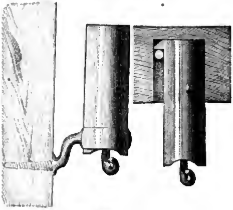

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3d. Strength, not to break or part by any strain by, or that a No. 8 wire will bear.

It is not injured by missiles in the general acceptance of the term.

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JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 9. NEW YORK, APRIL 1, 1870. WHOLE NO. 58.

LONDON vs. NEW YORK.

A VERY SIGNIFICANT COMPARISON.

Mr. Scudamore, the Government Manager of the Telegraphs in Great Britain, publishes a communication in the *Electric Telegraph and Railway Review* of February 26, for the purpose of showing how greatly the telegraphic traffic in London has increased since the lines passed into governmental control. According to Mr. Scudamore's figures, the total number of messages delivered from the telegraph offices in the

CITY OF LONDON

during the week ending February 19, 1870, was 15,479, being an average of 2,579 per day. The population of London at the last census was 2,803,989, which shows, taking the week stated as a basis, that all the telegraphs in Great Britain and Ireland deliver in London but one message per day for every 1,087 inhabitants.

The number of messages delivered in the

CITY OF NEW YORK

by the Western Union Telegraph Company during the month of February, exclusive of press reports, was 77,745, being an average of 3,239 per day. The population of New York City at the last census was 805,658, which shows that the Western Union Telegraph Company alone deliver in New York one message per day for every 248 inhabitants, or nearly four and a half times in excess of the London delivery.

◆

Difference of Time.

When it is 12 o'clock, at noon, in New York City, it is forenoon at all places west of New York, and afternoon at all places east, according to the following table:

	A. M.
Philadelphia	11 55 22
Buffalo, N. Y	11 36 32
Charleston, S. C	11 36 40
Cincinnati, O	11 16 18
New Orleans, La	10 56 46
Oregon City	8 46 40
Honolulu, Sandwich Islands	6 24 08
Quebec	12 28 06
St. Helena	4 33 40
London, England	4 55 12
Rome, Italy	5 46 03
Jerusalem	7 17 24
Calcutta	10 49 36
Montreal	12 01 44

The difference between Trinity Bay and Valencia Bay is about 2 hours and 48 minutes.—*The Old Franklin Almanac for 1870.*

THE TELEGRAPH IN SWITZERLAND.

By George B. Prescott.

As the arguments in favor of establishing governmental telegraphy in this country have been based to a large extent upon the great success of the Swiss system, we have thought it worth while to present a thorough history and analysis of the telegraph in Switzerland from its commencement up to the present time.

Tables A. and B. contain a summary of the telegraphic service in Switzerland from 1852 to 1869, copied from the official reports of the Swiss Administration. The total expenditures for telegraph service from 1852 to 1869 were..........$1,724,497 82

The receipts for telegrams............ 1,544,664 47

Loss $179,783 35

During the 17 years 4,294,023 internal telegrams were transmitted, the receipts for which amounted to $825,386 53, or 19 cents each; and 1,708 293 international and 507,758 transit messages, the receipts for which were $719,277 94, or 32 cents each. The total number of messages transmitted during this period was 6,510,074, the receipts upon which amounted to $1,544,664 46, or 23 cents each.

The average distance over which messages are transmitted in Switzerland is 50 miles, making the cost of each message per mile 4 6-10 mills.

The average tolls upon messages in the United States is 58 cents, and the average distances that they are transmitted 300 miles, making the cost per mile 1 9-10 mills, or less than one-half as much as the average Swiss rate.

By reference to table A. it will be seen that $210,387 67 were received from "divers other sources," which the official report states are essentially composed of contributions from the Communes. The various States belonging to the Confederation are required to contribute towards the first cost of establishing telegraphic facilities in any given locality. Every community, desiring to possess a telegraph within its district, has to share, pro rata, in the expenditure attendant thereon. This contribution is regulated by a tax, fixed at 60 cents for every 100 inhabitants. There is a further stipulation which requires from the local, or municipal authorities a guarantee to pay the current office expenses at the minor stations during the first three years; and, that the gross receipts at the central station of the district should reach at least a sum of $1,400.

The official report of the Swiss Telegraph Administration for 1866, contains the following explanation regarding these forced contributions and the necessity for continuing them.

"The general financial result is especially interesting, showing an excess of $43,226 in receipts over the expenses, a sum which represents the net benefit to the Confederation from the telegraph since the origin of the institution. *Or as the diverse other receipts, foreign to those of the telegraph proper, amounted during the same period to* $187,296 82, it shows that if the Confederation had not created these extraordinary resources—that is to say, *if the Government had desired that the expenses of the telegraph service should be covered by the receipts upon messages, there would be a total loss of* $144,07 15.

"The financial position of the administration of telegraphs, although satisfactory, *is not then so brilliant as it is sometimes represented*, and it is, therefore, important that we proceed with prudence in the reductions of tariffs, and retain for a while longer the extraordinary resources which have prevented the telegraph service from becoming a charge too heavy for the federal budget."

On page 5 of the same report the Swiss Administration shows by the following figures that low rates are not the only cause of a large amount of traffic—more messages being sent in Switzerland in proportion to population than in other European countries where the tariff was less. We quote the following from the Swiss Report for 1866:

"In Belgium the number of interior telegrams transmitted during the year 1866 was 692,536, which for a population of 4,531,000, shows that 153 messages were sent for every 1,000 inhabitants.

"In Switzerland the number of interior telegrams transmitted in 1866 was 383,158, which, for a population of 2,510,000 inhabitants shows that 153 messages were sent for every 1,000 inhabitants.

"Thus, compared to Belgium, Switzerland, in spite of an infinitely less dense population, in spite of an industry confined to a small extent of country, and finally, in spite of the difference in the tariff of 20 cents and 10 cents, Switzerland's interior service during the year 1866, was in proportion to population equal to that of Belgium.

"If we pursue the comparison further we shall see that in 1866 Belgium transmitted 306,596 international messages, and Switzerland 223,618, which shows that in Belgium 68 international messages were sent to each 1,000 inhabitants, and in Switzerland 89.

"In all other points of comparison we shall appear more favorable still. Thus, in Wurtemberg where they have enjoyed for several years the very low tariff of 14 cents, there were transmitted in 1865 only 113,647 internal messages, which for a population of 1,733,000 shows that only 66 messages were sent for every 1,000 inhabitants; and the number of international messages were only 84,064, or 48 for each 1,000 inhabitants."

The Swiss Administration publishes a table showing the original rates between Berne and various cities in Europe, and those charged at the present time. The following is a reproduction of this table, with the addition of the rates from New York to the same number of cities in the United States of similar distances:

FROM BERNE TO	Distance in miles.	Tariff in 1852.	Tariff in 1870.	FROM NEW YORK TO	Distance in miles.	Tariff in 1852.	Tariff in 1870.
London	700	$6 99	$1 40	Louisville...	700	$1 95	$ 75
Paris	400	2 61	60	Wheeling ...	400	1 35	91
Marseilles..	300	4 70	60	Pittsburg ...	350	1 15	25
Berlin.......	700	5 00	60	Chicago.....	750	2 05	1 00
Vienna......	450	5 30	60	Cincinnati..	600	1 90	60
Stuttgart ...	250	1 00	60	Buffalo......	400	75	50
Carlsruhe...	250	1 21	60	Baltimore...	200	70	35
Turin	180	2 00	40	Boston......	195	50	30
Rome	550	5 96	60	Milwaukee..	750	2 25	1 10
Naples	740	6 94	60	Galena......	1000	2 25	1 20
Constant'ple	1550	5 30	1 00	Memphis....	2000	2 85	1 35
	6350	$45 95	$8 40		7025	$17 60	$7 60

Average tolls between Berlin and eleven principal cities in Europe in 1852, 72 mills per mile.

Average tolls between New York and eleven principal cities in United States in 1852, 2 3-10 mills per mile.

Average tolls between Berlin and eleven principal cities in Europe in 1870, 1 3-10 mills per mile.

Average tolls between New-York and eleven principal cities in the United States, in 1870, 1 mill per mile.

All of the above rates are given in United States gold, *excepting the rates in America for* 1870, *which are given in paper currency.*

It will be seen from the above table that while in Europe in 1852 they charged $8 50 for sending a dispatch 1,600 miles, the rates in this country were only $2 85 for transmitting a dispatch 2,000 miles. It is not surprising that the European Governments should take great pride in having reduced their rates from 72 mills per mile to 1 3-10 between their great commercial cities. But we see no reason why we should not take equal pride in the fact that while 72 mills per mile were charged in Europe our tolls averaged but 2 3-10 mills, and that while in some few exceptional cases messages can now be sent in Europe for 1 3-10 mills per mile they are transmitted between the large towns in this country at the rate of one mill per mile by day, and one-half of a mill per mile at night.

It is a common fallacy of all the Quixotic advocates of postal telegraph schemes that the only thing necessary to make the service pay at the rates proposed is a sufficiently large increase of the traffic, assuming as a fact that there is comparatively no limit to the number of messages which a given extent of wires is capable of transmitting, and that the increase in the working expenses bears no considerable proportion to the increase of the volume of business. A careful examination of the accompanying tables will serve to dispel these illusions by showing that the increase in the number of messages is accompanied by a proportional increase in the cost of lines, salaries and other expenses. The comparisons in table C. show that when the business was small and the wires but partially occupied, a considerable increase in the number of messages was effected without material additions to the lines—the first outlay having been more than sufficient for the traffic. In 1861 an increase over 1856 of 46 per cent. in the number of messages, resulted in an increase in line of 24 per cent.; wire 34 per cent; offices 50 per cent; receipts 40 per cent.; and of salaries 54 per cent. In 1866 an increase over 1861 of 102 per cent. in the number of messages resulted in an increase of 56 per cent. in wire, 81 per cent. in offices, 62 per cent. in receipts, 74 per cent. in salaries, 53 per cent. in the expenditures for lines, and 50 per cent. in other expenses.

In 1868 an increase over 1866 of 72 per cent. in messages was accompanied by an increase in the number of miles of line of 20 per cent.; number of miles of wire of 56 per cent.; in offices of 38 per cent; in receipts for messages of 24 per cent.; in expenditures for salaries of 39 per cent.; in expenditures for lines of 99 per cent.; and in other expenses of 44 per cent: the total receipts being increased but 24 per cent., while the total expenses were increased 54 per cent.

On the 1st of January, 1868, the tolls upon inland messages were reduced 50 per cent., the rates upon international and transit dispatches remaining unchanged, with the following financial results:

RECEIPTS.	1867.	1868.
For messages or telegraph stamps........	$155,004 96	$173,695 12
Contributions from the Communes.........	7,242 05	8,161 13
Divers other receipts.....................	2,460 78	2,380 24
Total	$164,707 69	$184,236 49
EXPENDITURES.		
Salaries and commissions..................	$83,973 31	$106,260 88
Travelling expenses........................	3,064 03	3,020 00
Office expenses............................	9,306 05	15,966 74
Rent of buildings...........................	6,212 10	6,997 60
Construction and repairs of lines..........	34,006 13	62,091 35
Apparatus	10,602 87	16,397 60
Office furniture............................	1,629 06	1,383 06
Divers other expenses......................	798 41	1,008 75
Total..	$149,795 16	$211,821 29

Increase in expenses in 1868 over 1867, $62,026 13, or ***41** per cent.*

The total number of messages transmitted in 1867 was $708,020, and in 1868 *1,153,092, being an increase of 445,072, or ***63** per cent.*

Excess of receipts over expenditures in 1867, $14,912 53.

Excess of expenditures over receipts in 1868, $27,584 80.

In 1868 $173,695 12 were received for telegraph stamps, of which $2,846 66 were in circulation on the 31st December, 1858, unused, and therefore cannot properly be considered as belonging to the receipts of telegraphing for that year.

Of course the items of $8,161 13, contributed by the Communes, and $2,380 24 from diverse other sources, do not properly belong in the table of receipts for telegraphing. If we omit these three items, amounting in the aggregate to $13,388 03, the expenditures for 1868 exceed the receipts by $40,972 83.

In the table of the official report for 1868 only $21,025 32 appears under the head of construction and repairs of lines. This omission is explained as follows on page 23:

"In the item of construction and repairs of lines there was a diminution of $12,982 80 in expenses over those of 1867. *We should, however, observe that in the sum of* 21,125 32 *expended under this head, are not comprised the cost of new constructions,* those having been defrayed from the credit of $100,000 opened by the Administration in conformity with the Federal decree of the 17th July 1867, and it is only the interest on the advance received which appears in this item."

On page 2 of the official report is the following:

"It is proper to observe that in 1868 the expense of new constructions of lines were covered by a special credit of $100,000, while the corresponding expense of the year 1867 was comprised in the expenses of the ordinary budget. The special account of construction established in consequence outside of the administration account amounted on the 31st of December, 1868, to the sum of $41,855, 91."

Dividing the receipts by the whole number of messages transmitted, the average cost for the year is found to be 18 cents. If the whole business had been done at the internal rates the receipts would have been $84,981 17 less than the working expenses.

The average rates per mile for all classes of messages in Switzerland in 1868 were 3 3-5 mills. The average rate per mile for inland messages was 2 mills. Thus the rates upon the lowest class of messages is greater per mile in Switzerland than in the United States, while the rates upon the international and transit dispatches are nearly twice as great.

During the year 1867, in anticipation of the large increase of business by the reduction of the tolls, great additions were made to the lines and wires. At the beginning of 1867 there were 4,098 miles of wire in operation in Switzerland, and on the 1st of January, 1869, there were 6,438, (including 832 miles belonging to the railways) being an increase of 2,340 miles, or 57 per cent. in the number of miles of wire, while the total increase in the number of messages transmitted was but 63 per cent. *And yet it is officially stated in the report of the working of the Swiss lines that there was a time during the summer of* 1868 *when the number of messages was found to exceed the means of transmission.*

In 1865 Belgium had 5,400 miles of wire, and transmitted 674,027 messages. In 1868 she had 8,730 miles of wire, an increase of 3,330 miles, or 61 per cent., and transmitted 1,053,230 messages, an increase of 379,193 messages, or 56 per cent.

In 1866 Italy had 20,120 miles of wire, and transmitted 1,760,880 messages. In 1868 she had 29,283 miles of wire, an increase of 9,163 miles or 45 per cent., and transmitted 1,962,889 messages, an increase of 202,000 or 12 per cent.

In 1866 France had 68,687 miles of wire and transmitted 2,507,472 messages. In 1868 she had 89,086 miles of wire, an increase of 20,399 miles, or 29 per cent., and transmitted 3,209,965 messages, being an increase of 702,493 or 28 per cent.

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* These include the international messages sent and received. The actual number sent—not including transit—was 920,703.

In 1865 Sweden had 5,370 miles of wire and sent 328,464 messages. In 1868 she had 7,550 miles of wire, an increase of 2,181 miles or 40 per cent., and transmitted 503,062 messages, an increase of 174,598 or 53 per cent.

Thus it appears that any material increase in the number of messages transmitted requires a corresponding increase in wires as well as in operators, clerks, and other employes.

In adopting the reduced rate for internal telegrams and requiring their prepayment by stamps, the Swiss Administration sought to save a considerable sum by the abolition of the customary booking of the messages; and in order to still further diminish the annual expenditures for labor they offered *to reduce the minimum of the annual contributions in money imposed upon the communes for a period of ten years, from* $40,00 *to* $20,00, *provided a suitable person could be found to take charge of the office at a fixed salary of* $24,00 *per annum.* If this condition could not be obtained and they were compelled to pay a higher salary, the Administration would call upon the Communes for an increased annual contribution, amounting to the maximum of $40 00, when the fixed salary reached the sum of $48 00 per annum. In this way the Communes are interested in procuring employes who will serve for mere nominal salaries, and at the same time greatly reduce the expenses of the Administration. *Notwithstanding all these economical efforts, however, the expenditures for* 1868 *exceeded the receipts for the transmission of messages by over forty thousand dollars.*

In addition to the advantages possessed by the Swiss Administration of a monopoly of the telegraph business, of the right to levy arbitrary taxes upon the Communes, and of the receipt of over $15,000 per year upon transit messages, which are neither sent from nor received at any Swiss Station, but simply pass through the country, on their way to or from neighboring States they also have very advantageous arrangements with the railway companies by which they may utilize the wires and employes of the latter for the conveyance of telegrams, and receive 50 per cent of the income at railway offices. In case the railway wires are too much crowded with business the Telegraph Administration furnishes additional wire and the railway companies put them up and operate them.

The following is a summary of the employes of the Telegraph Administration on the 31st December, 1868: Direction 13; Inspectors 6; Cashiers 6; Heads of Offices 14; Telegraphists 145; Employes of the post office, toll-gates and private establishments serving in the telegraph offices at stated periods, 330; Messengers 35; Total, 549. Amount paid for salaries $106,260 83. Average annual salary of each employe $193 55. Average monthly salary $16 13.

The following comparisons will serve to show the relative extent, use and tolls of the telegraph in Switzerland and the United States.

Switzerland with a population of 2,510,494 inhabitants, has 2,662 miles of line, 5,606 miles of wire, 394 offices, and transmits 800,000 internal messages per annum, at the rate of 2 2-10 mills per mile.

The United States with a population of 31,148,047 inhabitants, has 73,036 miles of line, 130,695 miles of wire, 5,029 offices, and transmits 8,000,000 internal messages per annum, at the rate of 1 9-10 mills per mile.

In Switzerland the proportion of miles of line to population is 1 to 940; of wire 1 to 448; of offices 1 to 6,000; and of internal messages 1 to 3 1-10.

In the United States the proportion of miles of line to population is 1 to 420; of wire 1 to 238; of offices 1 to 6,000, and of internal messages 1 to 3.

Thus the United States, as compared with the most favored country in Europe, has in proportion to its inhabitants more than twice as many miles of line; nearly twice as many miles of wire; an equal number of offices, and sends annually a larger per centage of internal messages. And in spite of the increased cost of the service from competition; in spite of the high price of labor, which is more than twice as much on a specie basis as in Europe; and finally in spite of the high rate of taxation to which telegraph property is subjected in this country, messages are now transmitted throughout the United States in currency at a lower average rate per mile, than in any country in Europe.

The advocates of the various postal telegraph schemes in this country advance the singular theory that distance is not an essential element in the cost of transmitting telegrams, and consequently that an exhibit based upon the rate per mile is not a correct one. The fallacy of this theory is so apparent, however, that it would seem to need no refutation. Let us briefly enumerate the various elements of expense which enter into the cost of transmitting a dispatch. 1st, the construction of the line, which is directly proportional to distance. 2d, the maintenance of the line, which is directly proportional to distance. 3d, the battery power for the line, which is directly proportional to distance. 4th, the speed of transmission, which is directly proportional to distance. 5th, the operating expenses which are directly proportional to distance. Here, then, are all the principal elements of cost incident to the service, excepting that of the booking and delivery of messages, found to be directly proportional to the distance, and the expense of the last two items is directly proportional to the number of despatches transmitted.

"But," replies the advocate of the postal scheme, "your chief item of expense is in skilled labor, and it costs you no more for the labor employed in sending a message from New York to Chicago, for example, than it does from New York to Brooklyn." This, however, is a serious error. In the first place a higher class of labor is required to transmit messages over long circuits than short ones, and for this class of labor larger salaries are paid. In the next place long circuits require the introduction at intermediate points of instruments called repeaters, and skilled operators at all such intermediate places to tend them, so that the cost of transmission alone is thus increased three or four fold. But the utter fallacy of this class of reasoning is easily discerned when it is considered that out of 5,000 offices in the United States less than 50, upon an average, are in direct communication with each other, and that New York, the great metropolis, is in direct communication with only 250 stations. Messages, therefore, instead of being generally transmitted 500 and 1,000 miles by one manipulation, are repeated between the greater portion of the offices upon an average of every 100 miles. In most cases this repetition is made by hand, and every such repetition costs as much as the original transmission.

"But why don't you connect your lines so as to work direct between all the offices?" inquires the advocate of postal telegraphy. Simply because it would require more than 10,000,000 miles of telegraph line to place them all in direct communication, and would cost more than 50 times the amount of our national debt to build them.

From 1852 to 1868 the tariff in Switzerland upon internal dispatches was 20 cents for a message of 20 words, counting date, address and signature, the average receipts being 21 cents per message. During the same period the international and transit rates averaged 47 cents for each message. If the 6,510,074 messages transmitted during the 17 years had been sent at the average internal rate of 21 cents each, the account would stand thus:

Expenditures for 17 years	$1,724,497 82
Receipts	1,367,115 54
Loss	$357,382 24

If the 6,510,074 messages had been sent at the average rate of internal messages for 1868 the account would stand thus:

Expenditures for 17 years	$1,724,497 83
Receipts	716,108 14
Loss	$1,008,389 68

During the seventeen years of governmental control of the telegraph in Switzerland $165,493 92 were received upon transit messages alone, which were neither received at nor sent from any place in Switzerland, but simply passed through the country on their way to or from neighboring States. If the Swiss Government had not received this gratuity the loss upon the whole service since the beginning would have been $345,167 27.

If, therefore, the rates in Switzerland were shown to be less per mile for inland messages than in the United States instead of more, it would prove nothing in favor of substituting their system here for ours, since there is no transit or international service in the United States to bear the loss incurred upon the reduced internal rates.

The official reports show that there was an excess of expenditures for telegraph service over the receipts for messages in 32 countries in Europe during the year 1868 amounting to $2,066,042, and an excess of receipts for messages over the expenditures in five other countries of $652,419, showing a loss upon the entire service of $1,408,623. The loss is also shown to be mainly confined to those countries where the rates are the lowest per mile. Austria and Hungary lost $576,201; Belgium, $33,885; Denmark, $56,032; France, $569,817; Greece, $8,624; Holland, $32,729; North Germany, $258,972; Spain, $372,965; and Switzerland $40,972.

Belgium, which established a 10-cent rate for internal telegrams in 1865, but retained a 20-cent rate for international and transit messages, has not paid her expenses since the change was made, the loss amounting in some years to over $50,000.

The promoters of the various postal telegraph schemes may distort the European telegraph statistics and tolls as much as they choose, but the fact will still remain that the United States has the most extended system of telegraphs according to population, sends more messages in proportion to inhabitants, and transmits them at a less rate per mile than any other country on the globe.

THE TELEGRAPH IN SWITZERLAND.

STATEMENT, SHOWING THE TRAFFIC AND REVENUE FROM 1852 TO 1868.

TABLE A.

Year.	Number of Internal Messages.	Number of International Messages.	Number of Transit Messages.	Total Number of Messages.	Receipts for Internal Messages.	Receipts for International and Transit Messages.	Total Receipts for Messages.	Average Tolls Collected upon		Diverse Other Receipts.	Total Receipts.
								Internal Messages.	Internat'l & Transit Messages.		
1852	2,876	....	....	2,876	$708 39	......	$708 39	.24	....	$593 19	$1,301 58
1853	74,095	8,491	....	82,586	15,477 64	$10,096 36	25,574 00	.21	1.19	3,355 07	28,929 07
1854	109,599	17,716	1,852	129,167	21,985 58	19,791 90	41,777 48	.20	1.01	5,360 22	47,137 70
1855	138,966	25,388	8,527	162,851	26,712 64	23,565 61	50,278 25	.20	.81	10,886 11	61,164 36
1856	169,376	40,193	17,503	227,072	35,779 37	28,210 07	63,989 44	.21	.49	14,698 93	74,688 37
1857	192,664	45,768	21,732	260,164	41,226 05	32,619 15	73,845 20	.21	.48	16,260 78	90,105 98
1858	180,489	47,587	10,026	247,102	38,221 90	30,497 57	68,719 47	.21	.45	29,190 44	92,455 91
1859	196,425	63,424	27,027	286,876	42,614 00	42,503 11	85,117 11	.21	.47	41,148 00	126,265 51
1860	208,311	68,652	26,967	303,930	44,896 87	36,788 93	81,685 80	.21	.38	15,971 44	97,657 24
1861	217,700	75,733	38,500	331,933	46,726 30	42,884 91	89,611 21	.21	.37	10,874 67	100,485 88
1862	241,814	96,912	43,726	382,452	51,861 69	54,221 91	106,083 60	.21	.38	10,699 58	116,783 18
1863	298,778	116,212	41,881	456,871	63,699 14	62,450 76	126,149 90	.21	.39	8,227 10	134,377 00
1864	325,165	154,441	35,346	514,952	68,965 97	54,097 67	123,063 65	.21	.28	8,452 97	131,516 62
1865	364,118	196,377	30,719	591,214	76,275 62	69,037 22	145,312 84	.21	.30	8,403 61	153,716 45
1866	383,158	223,618	62,140	668,916	80,030 56	56,863 81	136,894 37	.21	.20	8,628 68	145,523 06
1867	397,333	245,154	65,533	708,020	82,403 95	72,600 93	155,004 88	.21	.23	9,702 82	164,707 70
1868	798,186	282,627	72,279	1,153,092	87,800 46	83,048 00	170,848 46	.11	.23	13,388 03	184,236 49
	4,294,023	1,708,293	507,758	6,510,074	$825,386 53	$719,277 94	$1,544,664 47			$210,387 67	$1,755,052 14

TABLE B.

Year.	Number of Leagues of Line in Operation.	Average Receipts per League	Number of Offices in Operation.	Average Receipts per Office.	Salaries.	Construction and Repairs of Lines.	Other Expenses.	Total Expenditures.
1852	..	....	34	$20 83	$9,141 12	$50,988 68	$34,686 51	$84,816 31
1853	..	....	70	365 34	20,090 50	23,284 68	14,448 92	57,824 10
1854	411	$101 65	90	464 20	21,047 72	10,382 37	12,313 00	43,743 09
1855	454	110 74	97	518 32	23,568 39	20,755 34	20,580 08	64,904 01
1856	501	127 72	105	609 42	28,384 98	24,501 34	20,576 12	73,462 44
1857	512	144 22	124	595 52	33,941 23	20,820 58	26,437 25	81,219 06
1858	514	133 69	127	541 10	36,344 50	21,886 15	27,547 89	85,778 54
1859	553	153 92	131	649 74	40,214 95	27,859 44	32,918 27	100,992 66
1860	601	135 91	145	576 30	41,222 84	28,106 57	18,641 94	87,971 35
1861	623	143 83	157	599 32	43,881 63	20,639 05	19,687 29	84,207 97
1862	661	160 49	177	590 30	48,420 56	34,084 25	17,895 59	100,400 40
1863	665	189 69	190	633 81	58,246 98	35,999 48	19,922 82	114,169 28
1864	692	177 83	223	551 85	63,526 13	29,280 02	21,610 59	114,416 74
1865	715	203 32	252	576 63	72,455 95	33,996 00	25,054 14	131,506 69
1866	714	184 74	284	482 02	76,358 43	31,593 33	29,531 24	137,478 00
1867	806	192 31	333	465 48	83,973 51	34,008 13	31,813 65	149,795 29
1868	891	191 74	394	433 62	106,260 83	62,881 23	42,679 23	211,821 29
					$807,075 45	$511,077 24	$406,345 13	$1,724,497 82

TABLE C.

STATEMENT, Showing the Percentage of Increase in Telegraphic Traffic, Wires, Receipts, and Expenditures, at Various Periods, from the Origin of the System to the Present Time.

	From 1853 to 1856.	Per Cent.	From 1856 to 1861.	Per Cent.	From 1861 to 1866.	Per Cent.	From 1866 to 1868.	Per Cent.
Number of internal messages	95,281	128	48,324	28	165,458	76	415,028	108
Number of international messages	31,702	360	35,540	88	147,895	195	59,009	26
Number of transit messages	17,503	....	20,997	120	23,640	61	10,139	16
Total number of messages	144,486	170	104,861	46	336,983	102	484,176	72
Number of miles of line in operation	270	22	366	24	354	19	449	20
Number of miles of wire in operation	540	22	666	34	1,485	56	2,313	56
Number of offices in operation	85	50	52	50	127	81	110	38
Receipts for internal messages	$20,301 73	130	$10,946 93	30	$33,304 26	71	$6,769 90	8
Receipts for international and transit messages	18,113 71	180	13,674 84	47	13,978 90	32	26,184 19	44
Total receipts for messages	38,415 44	150	25,621 77	40	47,283 16	52	33,954 09	24
Expenditure for salary	8,294 48	41	15,496 65	54	32,471 80	74	29,907 00	39
Expenditure for lines	1,216 66	5	*3,862 29	16	10,954 28	53	31,287 90	99
Other expenditures	6,127 20	20	*888 83	4	0,843 95	50	13,147 99	44
Total expenditures	15,638 34	27	10,745 53	14	53,270 03	63	74,343 29	54

* Decrease.

Electric Signal Apparatus for Railroads.

One of the earliest and most important applications of electro-magnetism was made in connection with the operation of railroads. On some roads the movement of trains is entirely regulated by telegraphic signals. The conditions under which trains or engines are allowed to move are, that every train leaving or passing a station is signalled out to the next station, and must not go on till the out signal is taken. Its arrival is signalled back to the last station, and no second train is allowed to follow until the first has arrived; for no two trains are permitted to be on the same length of railway between two signal stations at the same time. A train is considered in when within the protection of the semaphore signals of the station, and the telegraph permission for a second train to follow refers only to the open line, as far as the previous train is concerned, and extends only to the distant signals of the station. On approaching the station, the train is subservient to the visible signals.

The most ingenious and reliable apparatus for railway signals which I have ever seen are those in operation on the New York and New Haven Railroad, invented by Mr. Thomas S. Hall, of Stamford, Conn., consisting of a series of automatic electro-magnetic signals for switches, draw-bridges and road crossings. The signals are both sonorous and visual, a red disc being displayed, and a bell rung, whenever a switch is displaced, a draw-bridge opened, or a train approaches a road crossing. The apparatus for raising the signals and ringing the bells, is the same in principle for every application, the difference in the various devices consisting in the method for operating the signals. The movement of a switch causes a circuit to be closed which rings a bell and exhibits a red signal until the switch is replaced. The removal of the bolt which permits the opening of a draw-bridge, causes a bell to ring and a danger signal to be exhibited until the draw-bridge is closed. The road crossing signals are operated by the pressure of the car wheels upon a lever attached to the rail, which closes an electric circuit and holds it closed until the train passes the crossing and the wheels press upon another lever, which opens the circuit, when the danger signal drops and the bell stops ringing. These signals are admirably adapted for use upon single track railroads for preventing collisions, and upon both single and double track roads for preventing trains from running into each other from behind. They can very readily be arranged for signalling the position of every train upon the entire length of a road so as to render it impossible—unless the engineer should wilfully disregard the signals—for any two trains to collide, or for one train to run into another from behind. For deep cuts on short curves where the track cannot be seen for any considerable distance ahead, these signals would prove of the most invaluable service, and if generally adopted upon all the railways in the country would be the means of largely decreasing the annual destruction by railway accidents of both life and property.

The operation of these signals being automatic, they are not subject to the contingencies which render those made by hand so unreliable, for the most careful of men will sometimes forget to exhibit the signals, or become confused and give the wrong ones, while these automatic signals will not fail by night or day to perform their appointed duty with all the reliability and precision of perfect mechanism.

These instruments being inexpensive, simple in design, effectual and reliable in operation, and constructed in the most thorough and durable manner, will, I trust, meet the consideration which they deserve, and ultimately be generally adopted upon all railroads.

George B. Prescott.

HALF RATES.

Operators in a Fog.

The following letters will explain themselves. We have no doubt the writers think that telegraphy has come to a fearful pass when they are subject to being routed out of their warm sheets by anybody who wants to save 20 cents at their expense. The letters are highly elegant and imaginative, and we have enjoyed a hearty laugh over them both. The lady especially takes it in the most serio-comic mood. The man, however, seems deepest in the mud. He don't see how a message to be a *night* message can be delivered in the day time, and if nobody can be waked up at night how it can be got through! It is a bad fix, certainly. We must help them through before Miss Eliza rents a "whole house," or Joseph is sued for damages. Let all the distressed take notice.

FROM A LADY OPERATOR.

C. F. Wood, Most Worthy Superintendent.

Sir:—I don't think I fully comprehend the business of *half rate* messages.

Is it that I must get up and come one mile and three quarters any time some one feels disposed to benefit himself by sending for half rates in the night? Blessed sleep! How could I think of such a thing?—takes nearly all night to go back and forth. Suppose I might try and get a room nearer the office and keep "old maid's hall," but no one would wish to rent me a room if liable to be disturbed *half* a dozen times in a night, and if I get a *whole* house why, I should be frightened at the sound of the lightest footfall around the premises. "Alas! what troubles." Also, I would like to be informed at what hour night services commence and close.

Don't think the receipts of this office would fully compensate for day and night service too.

Yours most respectfully,

G.

FROM A TROUBLED MAN.

The telegraph business is now very low at full rates. The people have got to be so avaricious now-a days they will keep their messages till night, say 9 cases out of 10. Now, have we got to be called out in midnight to go and whack away two or three hours at some office when no one is up, for some one who is too tight to pay 20 cents more in the day time. As, for example, "Here, John, I have got a message from Boston; what will it cost to send ten words there?" "It will cost 50 cents." "Send it to-night; here is 25 cents." So John gets through the day tired, and closes up and goes home. After night hours commence he goes back to the office, gets up a light and a fire and commences to whack away at W. R. Junction, or at Northfield, or some whereelse. Whacks on hard; can't get them. Finally, gets out of patience and goes home. The sender has gone home. John has his message—what is he going to do? Keep the message? No. It will not answer the next night. Will it go the next day for 25 cents? No. Then, I say, what are you going to do? If you don't send, some one must pay the damage. If you can send it the next day, why I will keep all of my messages till next day and send them at night rates. So now, if you can answer those questions how it can be done, I will haul in my horns, as the deer did when he ran through the woods where the trees were not more than two feet apart, and his horns spread 8 feet.

Ops.

Now, to relieve Eliza and Joseph from further anxiety we repeat so much of Executive order No. 94 as applies to their cases, and which they will find at length in Journal of the Telegraph, Vol. 3, No. 2:

EXTRACT.

Half rate messages are required to be written upon No. 45 blanks, a supply of which will be kept on hand at every office for such use only.

Messages to be transmitted at half rates will be received at any hour during the day between 8 o'clock A. M. and 8 o'clock P. M. at all offices, and until 10 o'clock P. M. at stations which receive night press reports.

Offices which do not keep open all night must transmit all half rate messages on hand to their destination, or to the nearest repeating office before closing.

We hope the order is sufficiently clear. Miss Eliza may be comforted, and feel assured of an undisturbed sleep any night after 9 P. M. She need not rent that house. Joseph also may calm the tempest of his soul and be still. We hope all repeating offices will be considerate with the managers of way offices, and allow them to clear their files in good season. One word more. It is thought best that "red" blanks be used at *all offices*, even where night messages are merely repeated. It helps recognition. The desire is that these blanks shall be so used, and this may be regarded as an executive order to that effect.

Deep Sea Telegraph—From Europe, and Linking the Far East.

London, March 24, 1870.

The cable from Aden, Arabia, through the Red Sea to Suez, Egypt, has been successfully laid, thus completing a direct submarine line from Bombay to Suez. The completion of the Indo-European line was announced a few days ago.

This is still another route, and is destined to be the thoroughfare of the far East business. The line will be open to the public in a day or two.

A Very Hard Place.

For some reason not important to know, the Buffalo office sent a letter by mail addressed

"Manager,
W. U. Telegraph Office,
Salisbury, N. Y."

In the course of a few days the letter was returned with the following discouraging indorsement:

"don't Send Any more of these Letters to Salisbury for they is No Such office here Nor cant be for they is No Poles Neither is they a good Place."

We think after such a disconsolate notice that Buffalo will let Salisbury alone.

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March 9th, 1870.

Editor Journal of the Telegraph:

We had a little merriment in our office this morning which we are willing to share with your readers.

A message was received reading thus: "Get my *cow* out of the sleeping car," to the astonishment of the young operator, whose perplexity was relieved by the suggestion from another that the *w* in cow was probably a *t*, making an article more easily managed in a sleeping car.

A Reader of the Journal.

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Editor of the Journal:

How many words are there in the following message:

"I will write you to-night. Be sure to go to Post-Office to-morrow."

Answer. Twelve.

Journal of the Telegraph.

This Journal will be issued on the 1st and 16th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—
JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, APRIL 1, 1870.

Telegraphic Statistics.

The usual variety found in our columns will be missed in the present issue, although the material has been abundant, and much matter is on hand which must necessarily be deferred to our next issue. There seems now to be a necessity for the examination, critically and broadly, of the experience of foreign nations in telegraphic management so as to enable all intelligently to decide the proper sources of control in this. Such an examination cannot be made without information difficult of access to the ordinary reader, and which, when received, is very often, without apparent design, deceptive. It requires, in the very nature of the evidence received from abroad, much devotion of time and labor to so separate the various items necessary in evolving the truth, that the real results shall be distinguished from the apparent. To such a service our pages are, in this issue, largely devoted, and they may form the principal staple of one or two succeeding numbers. No intelligent reader will regret this. The future of the telegraph in America must be a subject of profound national interest to every thoughtful citizen. Every such citizen will thank us for information from so many sources, by which he may determine, for himself, the lessons they convey.

Switzerland is the field of the first inquiry, and the testimony given by the compiler is certainly both ample and astounding. For years the tariff in Switzerland was almost prohibitory, although apparently low. The bulk of its population being poor, a tariff which in America would appear small, was beyond the average capacity of the people to accept. And yet the telegraph in Switzerland was so desirable and so necessary that it was comparatively largely employed. The ordinary means of communication between its various cantons were slow and tedious, because of the want of railroads and the mountainous character of the country. The isolation of one canton from another was almost complete. And so this most interesting republic although only 216 miles in its maximum length and 140 miles in width, was composed of 25 States virtually separated from and foreign to each other. To such a nation a telegraph was a great boon when once its terms were adapted to the limited resources of its people. This has been measurably done. The tariff has been brought down to a point which has induced a very free use of the wires. In the haste to acquire governmental control here, the example has been shown to the American people, in ostentatious public debate, of the Swiss Government giving its citizens the means of telegraphic communication at merely nominal rates. But a careful scrutiny of the facts show that, poor as are the citizens of Switzerland, and low the minimum charges for telegraphic service there, the charge per mile is even less in the United States where the compensation for labor is vastly greater, and the general ability of the people much superior. But we commend the reader to Mr. Prescott's article. It will amply repay perusal even to those who are not specially attentive to the schemes for changing the character of telegraphic administration, but who are not unwilling to know that in the United States, under private control, the management of its great lines has been both liberal and energetic.

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Testimonial to Prof. Morse.

Prof. Morse is now far advanced in years. In a few days he will enter his eightieth year. He is yet hale, cheerful, and active. Yet life beyond 79 is an extension of the usual lease. We are glad, therefore, to announce that at the suggestion of Mr. Robert B. Hoover, of Alleghany City, Pa., it is proposed to present "the father of the telegraph" with a national testimonial, the particulars of which are unfortunately crowded out until our next. It will be an operator's testimonial, in which thousands will gladly join. We have been honored in being assigned to the chief post in carrying out this design.

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ONE of those periodical scares which pass over Wall street like April clouds, has just exhausted itself. The January statement of course showed a large reduction in net revenue, the reason for which was well known and extraordinary. But it was scarcely read before it was circulated through the street that "the Board had decided to pass the July dividend," and to which a morning paper added, "and apply receipts to purchasing stock." We need only say that there will be no meeting of the Board to consider the question of a July dividend before June.

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Telegraphic School.

The school opened in the Cooper Institute under the management of Miss Snow, for educating women for telegraphic service having been entirely successful notwithstanding the ignorant objections urged against it, young men between the ages of 17 and 22 are now admitted for a similar purpose. These are received without any promise of employment when educated, only so far as to be enrolled for service when a suitable vacancy occurs, if found competent. This branch of the school is under the general direction of J. C. Hinchman, Esq., Superintendent, to whom applications are to be sent.

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We regret to record the sudden death, by falling from the balustrade of the Fifth Avenue Hotel, New York, on Thursday evening, March 31, of Edward Morgan, son of A. B. Cornell, Esq. Vice President W. U. Telegraph Company aged 7 years, 2 months, 19 days.

GREAT BRITAIN.

The Continued Failure of the Government Telegraph System.

[Correspondence of the N. Y. Tribune.]

LONDON, March 5.

During the week that has elapsed since I gave an account of the working of the postal telegraph system, I don't perceive that there has been much improvement. Complaints keep coming in from all quarters. To register them all would be to re-write my former narrative. The provincial papers are still the victims of a provoking irregularity. They go to press sometimes with their full quota of telegrams, sometimes with half, sometimes with almost none. *The Leeds Mercury* of March 1 appears without any report of the speech of the First Lord of the Admiralty on the navy estimates, finished before 9 the preceding evening. In the same paper of the 2d and the 4th, the Parliamentary reports are mere fragments, while the issue of the 5th contains the speeches of the Lord-Chancellor on naturalization, and of Mr. Cardwell on the army estimates, which were not received in season the previous day. *The Manchester Examiner* of March 2 is unable to give the most important part of the debate on State aid to emigration the night before. The speeches of Sir Charles Dilke, Mr. McCullagh Morrens and Mr. Gladstone could not get over the wires. On the 4th, the same paper had only a portion of the speech of the Secretary of war on the army estimates, and none of the subsequent debate. These three debates on Emigration, the Naval Estimates, and the Army Estimates, have been the most important of the week. On the 5th it had only part of the debate on the Malt Tax, and no part of that on the Navy Estimates. *The Manchester Guardian* of March 5 gives the continuation of the report of Mr. Gardwell's speech on the Army Estimates, which should have been in the paper of the 4th. Like *The Examiner*, it received only a part of the Malt Tax debate—a subject, need I say, of enormous interest to the beer-loving Briton—and no part of the Navy Estimates debate. Under the old system, such debates were reported in the provincial papers with regularity and fullness. They put no extraordinary pressure on the wires. Their transmission may always be anticipated. Everybody knows when an important debate is to come off—except, apparently, the postal telegraph authorities. The weather is no longer exceptional, and that convenient excuse, after having been worked by Lord Hartington and Mr. Scudamore with a good deal more energy than they work the wires, has at last to be dropped. If the telegraphing were as good as the weather, we should have no cause to complain.

The Daily News of March 2 has a long article from which I cannot do better than make some extracts. Admitting some improvement, it says "the Post Office officials have not yet succeeded in getting the system into working order."

> "The Postmaster-General is hopeful, Mr. Scudamore is apologetic and confident, but the public, who are suffering immense inconvenience while the officials are learning the business, are tired of apologies and will soon begin to scold."

The following is still worse:

> "Complaints of an entire breakdown are, however, not altogether at an end. The Belfast newspapers of Monday had received no telegraphic dispatches from 1 o'clock on Saturday afternoon till 1 on Monday morning, and then only a meagre sheet or two had come in when they went to press."

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> "The ordinary complaints are, however, not so much of the stoppage of communications as of inefficiency and delay. There is no certainty about the telegraph. It may take your message as correctly and as quickly as of old; but there are about equal chances that it will either blunder or delay it. Nor is this inefficiency confined to any particular district. It is as great in the metropolis as elsewhere. It affects the London papers as much as it does the papers published in any other part of the country. Everywhere telegraphic intelligence is scanty, and what there is comes in a bad form. A GREAT SYSTEM OF INTERNAL COMMUNICATION HAS BEEN SMITTEN WITH PALSY, AND COMMUNICATION HAS BECOME HALTING AND FITFUL."

The Daily News is a paper of great circumspection. When it brings an indictment like that against a great

Government enterprise, it does not speak without book. Such a statement is not merely forcible—it is conclusive.

The management of the Post-Office telegraphs is then subjected by *The Daily News* to an elaborate and minute criticism, which I have not room to quote. It is shown that *efficiency of service is made a secondary consideration;* revenue the first, which is the point I have before dwelt on. It is shown that distinct offices have been consolidated, and the same number of clerks distributed over a wider extent of country; that the offices are unable to deal with a rush of business; that the clerks are beginning to put on leisurely airs; that, in a word, "we have all the elements of an inefficient administration; nor is there any hope of better things till efficiency has been put first and revenue second in the thoughts of the Heads of the Department, and underlings have everywhere been impressed with the supreme importance of promptitude and efficiency.

In the House of Commons there have been four fresh inquiries of the Postmaster-General, followed by four responses of the usual official nature. In neither case is any satisfaction given to the public.

Last week occurred the Tipperary election. The Dublin correspondent of *The Times* writes, Feb. 26:

> "The result of the Tipperary election to-day is not yet known, but is anxiously expected. Conflicting reports are flying about, and an unsatisfactory state of the telegraphic system leaves us as yet without any positive information. It was rumored that the wires were cut in some places, but the receipt of some telegrams disproved the statement."

The memorials of Glasgow and Liverpool have been followed by a memorial from the merchants of Dundee, complaining of the irregularity and delay in the transmission of telegraphic messages. The Dundee Town Council have taken the matter up officially.

Some of the railways dependent on the Government service are equally embarrassed, and it is stated that the directors of the North-Eastern Railway will shortly establish a telegraphic system of their own, with separate wires and under the control of an electrician of their own staff.

I close with two statements more significant than all. Dr. Calaban, Chairman of Mr. Kickham's Committee for the Tipperary election, has written to the Cork papers asserting that telegrams regarding the election were detained or suppressed by the Government officials. If this charge is true, I don't doubt that whatever subordinates may have been guilty of such an offense will be promptly dismissed. No such official connected with the Government is to be suspected of practicing or tolerating so base a manoeuvre as that. But true or not the charge needs to be met, and I have not been able to learn that it has yet been noticed in any way by any person having the means of denying it.

The other point is different but not less significant. An officer of the Central Press Association states that not a day passes without their receiving a batch of letters complaining of the non-arrival of telegrams contracted for, and containing news. The breakdown is, in fact, he says, so complete that it is suspected in their office that it must be intentional. At any rate, it will ruin them if it continues, and their subscribers are already threatening to withdraw.

We are now at the end of the fourth week of Government control of the telegraphs. I have shown but a small part of the injury that has been wrought by the new system. What the press suffers, and what great mercantile communities suffer, becomes known more or less completely. What individuals suffer can only be guessed. For one case brought to light, there are scores which remain unknown. Here and there a man sends his grievance to his newspaper, but that is the exception. We were promised great benefits from the new system. How long are we to wait before we are even as well off as before? And how long must those imaginary benefits go on accumulating before they can counterbalance the annoyances of every kind, that have been endured during the four weeks already past?

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It is announced from Paris that the efficient and able Director General of the French Telegraph, Viscount de Vougy, has ordered the recent Report of Prof. Morse on the Telegraph apparatus of the Exposition of 1867 to be translated for distribution in France.

REVISED RULES.

Executive Office,
Western Union Telegraph Company.
145 Broadway, New York, March 29, 1870.

EXECUTIVE CIRCULAR NO. 12.

A revised edition of the Rules and Instructions for the information and guidance of the employes of the Company, has been prepared, and will be issued immediately to all offices *to go into operation on the first of May.*

All employes of the Company should promptly familiarize themselves with every rule, so that no errors or irregularities may occur through ignorance of their requirements.

Particular attention is called to rules 4, 6, 9, 10, 13, 14, 26, 29, 36, 40, 43, 52, 66, 77, 83, 90, 91, 92 and 93, which contain new or material modifications of former instructions. Copies of the old book of rules, now in the hands of the employes, will be sent to the District Superintendents with the April reports.

Very respectfully,
(Signed) Wm. Orton,
President.

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TARIFF BUREAU.

Semi-Monthly Circular.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
April 1, 1870.

To all Offices on W. U. Lines

The following changes in tariff have occurred since March 15th, the date of the last tariff order. Please note them in your tariff book:

ATLANTIC CABLE BUSINESS.

Change of Tariff to Arabia, India, Ceylon and China.

We are advised of following rates of tariff by Direct Submarine Line, to take effect April 1st, 1870.

From London to	10 words	20 words
Aden, Arabia,	9 25	13 12
Bombay, India,	10 00	15 00
Other stations in India,	11 18	16 87
Ceylon and Farther India,	12 12	17 87

Every additional 10 words or fraction of ten words beyond 20, to be charged one half of the 20 word rate.

China, "Post Galle," 25 cents more than the Ceylon rate.

NEW OFFICES.

271 Anoka Junction Ind.
280 Argos, Ind.
258 Calhoun Ga.
307 Dolton, Ill, re-opened, heretofore known as Dalton, Ill.
17 Epping, N. H.
319 Florence, Ala.
447 Greenwood, Mo
448 Girard, Ks.
408 Green Top, Mo.
• Hamburg, Pa.
428 Lamonte, Mo.
375 Milneburg, La.
16 Monmouth, Me.
389 Martinsburg, Mo.
375 Ponchatoula, La.
406 Queen City, Mo.
• Raven Run, Pa.
19 Readfield, Me.
21 Riverside Press, Mass.
307 St. Louis Crossing, Ill.
• Schoharie, N. Y, formerly W U Office

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.	Leaves this Line.
Hamburg, Pa.	35 3	Philadelphia or Harrisburg.
Raven Run, Pa.	35 3	" "
Schoharie, N Y.	25 2	Central Bridge, N Y.

OFFICES CLOSED.

Princess Anne, Md., and Ft. Sedgwick, Col. Business for Princess Anne will be mailed at Salisbury, Md.

OFFICES HAVING "SPECIAL SHEET A."

Tariff to St. Johnsville, N. Y. will hereafter be same as "special rate" to Ft. Plain, N. Y.

GENERAL INFORMATION.

The name of the office heretofore known as Arlington, Ga. has been changed to Jesups, Ga.

Point of Rocks, Wy., is a W. U. Office. Tariff as given under heading "Rate to San Francisco, Cal." in Journal of March 1st.

Ridgefield, Conn., an "other line" office has no tariff in Part II of Tariff book. The rate is 25 and 2 from Hartford, Conn.

Business for the following points will be checked as indicated herewith:

Northfield, N. H. direct, instead of to Tilton, N. H. as per Journal of March 1st.

Epping, N. H., to Newmarket Junction, N. H.

Riverside Press, Mass., to Cambridgeport, Mass.

East Cambridge, " Boston, delivery charges from Boston 25c.

Harrison Square " Neponset, Mass.

Quincy " " "

Delivery charges for Harrison Square and Quincy, 18c from Neponset.

Messages may be taken for the following points, which are offices to and points around the city of Philadelphia.

Business for any of the points named will be checked to Philadelphia, and the amounts stated below for "Local delivery" will be entered as "Other Lines."

PHILADELPHIA CITY DELIVERY.

All telegrams to points within a thousand numbers, or ten blocks, of the main office (No 250 Chestnut street and 101 and 103 South Third street) delivered free.

PRINCIPAL HOTELS.

All free, except the "La Pierre House" to which the charge is 15c.

RAILROAD DEPOTS.

Philadelphia, Wilmington and Baltimore,	15 1
New York Depot, West Philadelphia,	15 1
New York Depot, Kensington,	15 1
Pennsylvania Central, West Philadelphia,	15 1
Westchester, Media and Baltimore Central	15 1
Philadelphia and Reading,	15 1
North Pennsylvania	15 1
Philadelphia, Germantown and Norristown	18 1

POINTS IN VICINITY OF PHILADELPHIA.

Arsenal, Bridesburg,	50 2	League Island,	100 1
Arsenal. Gray's Ferry,	15 1	Laurel Hill,	75 -
Avenue Drove Yards,	10 1	Lazaretto,	100 -
Alms House (Blockley)	15 1	Manayunk,	30 1
Bustleton,	200 1	Mount Airy,	75 2
Bridesburg.	35 1	Moyamensing,	15 1
Blue Bell,	100 2	Milestown,	150 2
Branchtown,	100 2	Mantua,	10 1
Chelton Hills,	150 2	Mt. Pleasant,	75 2
Chesnut Hill,	75 1	Nicetown,	50 2
Columbia Bridge,	50 2	Naval Asylum,	15 1
Darby (Upper or Lower)	150 2	Navy Yard,	15 1
Eastern Penitentiary,	15 1	Old York Road Station,	50 2
Frankford,	10 1	Point Breeze	100 -
Falls of Schuylkill,	75 2	Park Drove Yards,	10 1
Fox Chase,	200 2	Roxborough,	85 1
Fairmount	15 1	Red Bank (N J) on Del. R.	75 -
Fort Mifflin,	150 -	Rising Sun,	75 2
Germantown,	30 1	Spring Mills,	50 2
Gloucester, (N J)	30 -	Tioga Station,	50 2
Greenwich Point,	50 2	Torresdale	150 1
Holmesburg,	125 2	Union Drove Yards	10 1
Harrowgate,	50 2	Woodland Terrace	25 1
Hestonville,	10 1	Wayne Station,	50 2
Haddington,	30 2	Whitehall, near Frankford	50 2
Kingsessing,	100 1	Wissahickon,	75 2
Kensington,	10 1	West Philadelphia,	10 1
Kirkbrides, Insane Asylum	50 1		

Lists of offices in and around New York and other cities, which have a local system of delivery, will follow in succeeding numbers of the Journal. Their publication is made necessary from the fact that complaint has been made by managers of their inability to collect from the receiver of a message the expense of its delivery when the message is of interest only to the sender.

WILLIAM ORTON, President.

Death of Charles Dykeman Smith.

Ch D. Smith of Summit, Illinois, whose death we announced in the JOURNAL of March 15th, was born in Lansingburgh, N. Y., September 7th, 1808. He died in Chicago, Ill., March 3d, 1870, aged 61. He went to Calhoun County, Michigan, in 1832, and built and opened the first frame store erected in the county. He went to Chicago in 1842, where he remained until 1855. He was the first man, it is believed, who learned to telegraph in the State of Illinois. He opened the Kenosha office in 1848, and was then connected with the Chicago office. He was the first agent of the Galena and Chicago Union Railroad. For the last four years he was agent at Summit, Cook County, Ill.

On the morning of the day of his death he went to Chicago on some business. Having transacted it, he left the house of his son on West Randolph street, about 1 P. M. When about seating himself in the train he was seized with faintness and died of apoplexy in 30 minutes. He was buried at Rosehill Cemetery on Saturday, March 12th. The funeral services were conducted by the Rev. Mr. Knowles, at the Cathedral of Saints Peter and Paul, West Chicago.

Mr. Smith was father of Day. K. Smith, Superintendent of Telegraphs, and Assistant Superintendent Toledo, Peoria & Warsaw R. R. Co., Peoria, Ill., and was much esteemed. He leaves a widow, who will be the recipient of the money due from his insurance.

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Telegraphers' Mutual Life Insurance

ASSESSMENT NO. 11

Samuel Porter,
J. M. Peters,
C. N. Lamb,
Michael Foley,
A. J. Stoddard,
Mary C. Joseph,
W. J. Ives,
A. S. Parmelee,
William Roche,
F. A. Seibert,
A. W. York,
C. M. Clark,
W. J. Evans,
George A. Dodd,
T. T. Onderdonk,
T. D. Gibbens,
F. A. Jordan,
A. A. Howard,
A. G. Allison,
E. A. Keene, Jr.
Albert Griggs,
Peter A. Smith,
John B. Hurd.
C. D. Littlejohn,
A. V. Hodskin,
J. B. Leatch,
Taylor L. Brown,
J. W. Sampson,
Fred Crouse.

ASSESSMENT NO. 12.

John C. Thomas,
J. W. McDonald,
J. W. Hay,
Julian Soule,
W. M. Popper,
Martin Barth,
J. H. Purnell,
J. Babcock,
Wm. Riddle, Jr.,
Charles H. Wolcott,
A. V. Hodskin,
S. Lawrence,
Annie E. Myers,
J. M. Whiteley,
Mary F. Houseman,
Emma Sammis,
M. S. Roberts,
Wm. Cook,
A. J. Reinbold,
N. A. Brown,
Henry Griffith,
J. A. Brenner,
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Gerritt Smith,
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M. L. Rothcrauff,
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J. P. Bignon,
F. C. Gay,
D. A. Van Nam,
Ellis Stone,
G. W. Dyer,
Fred Crouse,
N. S. Wood,
Smith Roberts,
Alfred Weller,
C. H. Henshaw,
H. H. Abrams,
John Coyne,
Geo. Muttart.

◆

CONDITION OF THE ASSOCIATION.

Certificates issued to March 3,		766
Deceased,	12	
Dropped,	71	
Delinquent,	63	
Members who have paid,	569	
New members, to March 3,	52	766

Last certificate issued, 806, to James K. Polk, March 29.

JANUARY 1870.

Western Union Telegraph Company—Central Division.

LEFT THE SERVICE.

A. L. Baker, Chicago,
John Leatch, Chicago,
D. S. Anderson, Chicago,
E. P. Whitford, Chicago,
J. H. Gage, Chicago,
M. A. Huyck, Chicago,
A. H. Spracklin, Chicago,
C. G. Rawlins, Chicago,
D. T. Berry, Chicago,
W. H. Kelsey, Chicago,
C. H. Balch, Chicago,
Wm. Stonebach, Chicago,
A. C. Knapp, Chicago,
D. S. Foote, Chicago,
F. S. Smith, Chicago,
Geo. S. Stanton, Chicago,
J. J. Kinnamon, Chicago,
J. F. Bradley, Chicago,
Wm. Bailey, Chicago,
S. Ryder, Chicago,
Miss F. M. Wheeler, Chicago,
Miss E. Stanton, Chicago,
Miss J. J. Wirt, Chicago,
M. A. Smith, Des Moines, Iowa,
M. S. Bacon, Des Moines, Iowa,
J. C. Graham, Davenport, Iowa,
W. A. Leary, Rock Island, Iowa,
H. M. Harris, Springfield, Ill.,
J. H. Crane, Springfield, Ill.,
E. L. Parmalee, St. Louis, Mo.,
E. A. Street, St. Louis, Mo.,
John E. Bremer, St. Louis, Mo.,
David A. Logan, St. Louis, Mo.
A. E. Brown, St. Louis, Mo.,
J. P. McClure, St. Louis, Mo.,
W. J. Landy, St. Louis, Mo.,
John H. French, St. Louis, Mo.,
Chas. D. Thomas, St. Louis, Mo.
S. B. Frazer, St. Louis, Mo.,
Noah Frissell, St. Louis, Mo.,
Thos. W. Russell, Fort Leavenworth,
J. D. Sears, Cheyenne,
W. J. Hamilton, Cheyenne,
W. J. Lewis, Cheyenne.
L. S. Wild, Corinne,
E. A. Mead, Corinne,
Flemon Drake, Omaha,
E. Rosewater, Omaha,
E. L. Armstrong, Omaha,
Luther Drake, Omaha,
E. F. Smith, Omaha,
S. L. Wallace, Omaha,
J. F. Hughes, Pittsburgh,
B. F. Gilmore, Pittsburgh,
P. J. McKeever, Pittsburgh,
E. W. H. Cogley, Pittsburgh,
W. M. Munson, Pittsburgh,
E. L. Maize, Pittsburgh,
G. W. Gregory, Buffalo, N. Y.
A. Nesbit, buffalo,
G. A. Lance, Buffalo,
George Warren, Buffalo.
J. W. Larish, Buffalo,
H. F. Persch, Buffalo,
J. F. Farrel, Bay City, Mich.
W. H. Eckman, Cleveland, O.,
D. McD. Hall, Cleveland,
O. W. Nash, Cleveland,
W. H. Wallace, Cleveland,
J. D. McKinstry, Cleveland,
G. Bruner, Cleveland,
W. C. Griswold, Cleveland,
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J. McNamara, Cleveland.
H. S. Converse, Cleveland,
J. D. White, Cleveland,
O. A. Gurley, Cleveland,
W. H. Sterling, Detroit,
G. W. Lee, Detroit,
J. H. Byrne, E. Saginaw,
F. O. Ackley, Saginaw City,
F. Mann, Jackson, Mich.
E. W. Fish, Toledo,
J. A. Murray, Toledo,
A. E. Lang, Toledo,
F. C. Long, Toledo,
C. Humphrey, Warren, O.
J. A. Fuller, Indianapolis, Ind.
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D. T. Trimble, Cincinnati,
E. C. Stevens, Columbus, O.
A. B. Green, Connersville, Ind.
J. F. Whitlock, Ind., Cin. & Laf. R. R.

Whole number of strikers.......................219
Re-employed.......................96

◆

Married.

CHAPIN—COLLER.—On Wednesday, March 2, 1870, at the residence of the bride's father, by Rev. John W. O. Wooden Mr. W. H. Chapin, Manager W. U. Telegraph Office, Conesus, N. Y., to Miss Lizzy Coller, of Conesus.

DUNNING—RORBACH.—In Newton, N. J., at the residence of the bride's parents, on the 22d of February last, by Rev. Theodore L. Byington, G. B. Dunning to Margaret Rorbach, daughter of Charles P. Rorbach, all of Newton.

◆

Died.

MURPHY.—In Westfield, Mass., March 24, of consumption in the 24th year of his age, Mr. John W. Murphy, late Manager of the W. U. Co.'s West Troy, N. Y. Office.

WHEELER.—In Sharon, Conn., March 24, suddenly, of lung fever, in the 19th year of his age, Mr. E. L. Wheeler, late Manager of the W. U. Co.'s Millerton, N. Y., Office.

MY TRIUMPH.

BY JOHN G. WHITTIER.

The autumn time has come;
On woods that dream of bloom,
And over purpling vines,
The low sun fainter shines.

The aster-flower is failing,
The hazel's gold is paling;
Yet overhead more near
The eternal stars appear!

And present gratitude
Insures the future's good,
And for the things I see
I trust the things to be;

That in the paths untrod,
And the long days of God,
My feet shall still be led,
My heart be comforted.

O living friends who love me!
O dear ones gone above me!
Careless of other fame
I leave to you my name.

Hide it from idle praises,
Save it from evil phrases;
Why, when dear lips that spoke it
Are dumb, should strangers wake it

Let the thick curtain fall;
I better know than all
How little I have gained,
How vast the unattained.

Not by the page word-painted
Let life be banned or sainted:
Deeper than written scroll
The colors of the soul.

Sweeter than any sung
My songs that found no tongue;
Nobler than any fact
My wish that failed of act.

Others shall sing the song,
Others shall right the wrong—
Finish what I begin,
And all I fail of win.

What matter, I or they?
Mine or another's day,
So the right word be said
And life the sweeter made?

Hail to the coming singers!
Hail to the brave light-bringers!
Forward I reach and share
All that they sing and dare.

The airs of heaven blow o'er me,
A glory shines before me
Of what mankind shall be—
Pure, generous, brave and free.

A dream of man and woman
Diviner but still human
Solving the riddle old,
Shaping the Age of Gold.

The love of God and neighbor—
An equal-handed labor;
The richer life, where beauty
Walks hand in hand with duty.

Ring, bells in unreared steeples,
The joys of unborn peoples;
Sound, trumpets far off blown,
Your triumph is my own!

I feel the earth move sunward,
I join the great march onward,
And take, by faith, while living,
My free-hold of thanksgiving.

[*Atlantic Monthly, for April.*

Journal of the Telegraph.

Gives it Up.

The Buffalo *Commercial Advertiser*, which has proved the unwearied advocate of anything which would rid the world of the "great monopoly," and has advocated the Postal Telegraph schemes with all its admitted ability, finally makes this significant and sensible remark:

> "The probability is that the system will not be adopted in this country, at least for some years to come, notwithstanding the favorable reports of its working in Great Britain (!) and France. Nor does it follow indeed that it ever could be worked as well in the United States as in those countries; but no harm can come of giving the truth with regard to the matter."

Exactly. We recommend to the *Commercial* the reading of the *London Daily News* of March 2, which we have no space to give in our present issue, but will provide in our next. Extracts, however, from that paper may be found in the correspondence of the New York *Tribune*, in another column, which will whet the appetite for the rest, and show that "all is not gold that looks like corn." So far, the British Government telegraph has been a miserable failure. The management has shown an utter lack of appreciation of the prime necessities of the movement they have so confidently inaugurated, and some time must elapse before that easy and free use of the wires can be given, or confidence be inspired by the employment of intelligent agents, which shall satisfy the British people.

The American people are thus becoming enlightened on these topics, which really have great national significance, and challenge the utmost scrutiny by every intelligent citizen. If we mistake not the mind of the nation to-day, it is this, that aside from the mere agitation of interested persons, and of votes by a few public bodies which mean nothing, the postal telegraph as a department of our Government service is more distant than ever.

◆

Postal Telegraphy.

As an illustration of the speed and accuracy with which postal telegraphic messages are transmitted the Birmingham *Post* mentions that a message dispatched from Birmingham to Ipswitch at one o'clock in the afternoon reached its destination at nine o'clock the same evening, and that whereas it originally requested the receiver to go to York, this direction, in the course of transmission, was converted into the astonishing request that he should "go to Cork."

◆

A COMPANY has been formed, with a capital of £250,000, in £10 shares, to purchase the telegraph works of Mr. Hooper, at Mitcham, at a cost of £65,000, the consideration for patents and good will being to consist of one-half the net profits of each year after 7½ per cent per annum has been paid to the shareholders. The arrangement to be limited to ten years.

McKee's Railroad Signals.

About a year ago we called attention to the invention of Mr. William McKee of Neponset, Illinois, for arranging station signals on railroads to be operated by telegraph operators without requiring their absence from their instruments. A year's experience since then has demonstrated the value of the invention, and Mr. McKee uses our columns elsewhere to advertise it to those to whom it may be valuable. The whole arrangement consists in a signal box so placed as to be visibie to trains from both directions, displaying flags by day and lamps by night, and under the control and in sight of the operator at his desk. He is thus able to respond promptly to all orders, with great advantage to trains, and much comfort to himself, never having occasion to leave his office for such duties. Where young women are employed at stations this arrangement has additional value, rendering her competent to a duty usually assigned only to men. We hope Mr. McKee, who is a practical operator, will be successful in inducing a large use of his invention, and secure a suitable remuneration therefor.

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They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer.

McKEE'S RAILROAD SIGNAL BOX.

All Signals connected with the Railroad service should be uniform, conspicuous, and ready to display at a moment's notice. Under the present system when an operator receives an order to detain a train, he has to take his flag, hunt a suitable place to stick it up, and keep running out every minute until the expected train arrives, to see that his flag or lantern don't get misplaced, or the view obstructed. More accidents occur from the proper signals not being shown than by any neglect on the part of operator or trainmen. The importance of having those Signals placed in a conspicuous position cannot be overestimated; it is the basis of all train dispatching by telegraph. This long needed improvement has been supplied in

"McKEE'S SIGNAL BOX,"

patented April 28, 1868, and February 8, 1870. This Box is in use on many roads, and all attest to its merits. Below we hand a few of the many letters we have received from railroad officials:

McKEE & CO.

GENTLEMEN: I am very happy to express the satisfaction that McKEE'S TELEGRAPH SIGNAL BOX has given since its adoption on this road, and especially when, on riding over other roads, I see how superior our system of displaying Telegraph Signals is to that practiced elsewhere.

ROBERT HARRIS,
Gen'l Sup't C. B. & Q. R. R.,

MESSRS. McKEE & CO.

The SIGNAL BOX got up by Mr. William McKee has been in use on this road for the past year, and gives general satisfaction. The facility with which the flag or lamp can be displayed and the operator remain beside his instruments, its safety, simplicity, and durability, recommend it as an invaluable adjunct in working a railroad, and I cheerfully attest to its merits,

CHAS. R. PEDDLE,
Gen'l Sup't Terre Haute & I. R. R.

MR. McKEE.

DEAR SIR: I will say that your SIGNAL BOX has been adopted on this line of road, and gives entire satisfaction. I do not hesitate to recommend it as the best arrangement for the protection and display of Railway Signals I have yet seen.

J. C. McMULLEN,
Gen'l Sup't Chi., Alton & St. Louis R. R.

We have many other letters of a similar character.

We are now prepared to furnish any number of BOXES on short notice and reasonable terms, or will sell rights to companies to manufacture and use on their respective roads. The attention of R. R. Telegraph Superintendents is especially called and correspondence solicited.

McKEE & CO., Neponset, Illinois.

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I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postage, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and the payment of dues.

XI. A meeting for the election of officers shall be held annually during the first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written request of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

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1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to Gerritt Smith, Secretary Telegraphers' Mutual Life Insurance Association, 145 Broadway, New York, and a certificate of membership will be sent by return mail.

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

5. No letters can be answered unless a stamp is enclosed for postage; and as the officers labor without compensation, correspondence requiring answers should be as limited as possible.

By permission of the Western Union Company, and to avoid risk by mail, remittances may be made by an order signed by a Manager on John Horner, Cashier, New York office. Whenever practicable it is desirable this should be done.

Western Union Telegraph Company.

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The JOURNAL OF THE TELEGRAPH is the official organ of the Western Union Telegraph Company, through which are promulgated, for the information of the Stockholders and public, authentic details relating to the financial affairs of the Company—embracing a monthly statement of earnings, expenditures and net profits—and the orders of the Executive Officers to the employes. In its columns will also be found accurate and valuable information in regard to the operation and extension of the lines, and a full discussion of all other matters of a scientific or general character pertaining to the telegraphic art.

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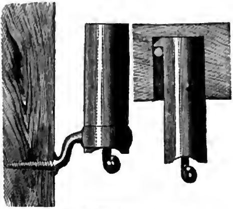

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JOURNAL OF THE TELEGRAPH.

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CYRUS W. FIELD.

It is no part of the duty or desire of this paper to thrust any man or invention into obtrusive notice. It would be false to its mission, however, did it not seek by every proper means to illustrate telegraphic history, by presenting both the names and the faces of those who have been recognized by the world as its great laborers and pioneers. No one, certainly, will accuse us of a desire to flatter the subject of our present sketch. We cannot say a word in appreciation of Mr. Field or of his great work, which has not been said with a deeper emphasis and a more glowing eloquence by the representatives of the great nations which are, to-day, through his instrumentality, united by a bond which all coming time will fail to break, and which has been hailed as the harbinger of universal citizenship and peace. We are proud of the friendship of such a man, and as a token of personal esteem, as well as of duty, we present to our readers the best likeness which has yet been given of Mr. Field to the public.

Photographed by Sarony. Engraved by J. L. Langridge.

Cyrus West Field was born in Stockbridge, Mass., Nov. 30, 1819. In 1853, having been successful in his mercantile pursuits, he partially retired from business and spent some time traveling in South America. On his return, his attention was called to the subject of trans-Atlantic telegraph communication by circumstances which we must now briefly notice as an interesting link in the history of natural development.

In the Winter of 1849-50, two men, one the Roman Catholic Bishop of Newfoundland, Dr. Mullock, the other Mr. Frederic W. Gisborne, an English telegraph engineer, then engaged in erecting telegraph lines through Lower Canada and New Brunswick, had their attention directed to the importance of St. John's, Newfoundland, as the nearest touching point for English steamers to America, and to see that—if the British telegraph lines could be extended to the west Irish coast, and the American lines be extended to St. John's—communication between the two continents could be shortened from three to four days. Acting upon this thought, Mr. Gisborne immediately resigned his management of the Nova Scotia Telegraph Company, obtained £500 from the Newfoundland Legislature to enable a survey to be made of the route between St. John's and Cape Ray, and commenced a thorough exploration through Newfoundland of 350 miles of wilderness, up to that time almost unknown to human footsteps. In 1852, the exploration having been completed, Mr. Gisborne obtained an exclusive right to erect telegraphs in Newfoundland for 30 years, with important concessions of land to aid the enterprise, and organized a Company in New York to carry out the design. In 1853, after having built 30 miles of the line, his drafts were dishonored, he was sued and prosecuted on all sides, stripped of his property, and arrested. Under such circumstances, Mr. Gisborne gave up all his own property of every kind to pay off honorably the men who had served him, and in February, 1854, came to New York to see what could be done to accomplish his work.

Having seen his former associates, and been refused any further aid, Mr. Gisborne was introduced to Mr. Field, who, becoming interested in the details of a scheme having in it so many elements of fascinating enterprise, but without any desire to embark therein, invited Mr. Gisborne to his house where the evening was spent in the examination of the routes proposed and the points to be reached. After Mr. Gisborne's departure an examination of a large globe in his library, and the knowledge of Mr. Brett's successful laying of a cable 27 miles in length, connecting Dover and Calais, inspired in Mr. Field's mind the idea of the possibility of connecting the two continents in a similar way. This seems to have been clearly a thought of Mr. Field's, since Mr. Gisborne does not appear to have had any design beyond reaching by land telegraph the points of land on either continent nearest each other, so as to shorten the period of communication by steam.

The morning following this interview, Mr. Field, with characteristic energy, wrote to Lieutenant Maury, then at the head of the National Observatory at Washington, asking information respecting the scientific problems involved in the laying of an Atlantic Cable, and also to Prof. Morse for a knowledge of the laws of electricity by which distant communication could be assured. It is a singular circumstance that Mr. Field's letter to Lieutenant Maury found that officer engaged in writing a report to the Secretary of the Navy on the result of oceanic explorations of the Atlantic, especially along the line of the merchant service with England, between Newfoundland and Ireland, in which the following singular language occurs :

"The result is highly interesting, in so far as the bottom of the sea is concerned, upon the question of a submarine telegraph across the Atlantic. From Newfoundland to Ireland the distance is about 1,600 miles, and the bottom of the sea between the two places is a plateau, which seems to have been placed there expressly for the purpose of holding the wires of a submarine telegraph, and keeping them out of harm's way. The depth of this plateau is regular, gradually increasing from the shores of Newfoundland to the depth of from 1,500 to 2,000 fathoms. On that beautiful plateau the waters of the sea seem to be as completely at rest as they are at the bottom of a mill pond. There are no perceptible currents, and no abrading agents at work at the bottom of the sea upon the telegraphic plateau. I derive this inference from the study of a physical fact which I little deemed, when I sought it, had any such bearings."

"Lieutenant Berryman, who had command of the service, brought up with Brookes's deep sea sounding apparatus specimens of the bottom from this plateau. I sent them to Prof. Bailey of West Point for examination under his microscope. This he kindly gave, and that eminent microscopist was quite as much surprised to find, as I was to learn, that all those specimens of deep sea soundings are filled with microscopic shells ; to use his own words, '*Not a particle of sand or gravel exists in them.*' These little shells, therefore, suggest the fact that there are no currents at the bottom of the sea, whence they came. Had there been currents at the bottom, these would have swept and abraded and mingled up with these microscopic remains the *debris* of the bottom of the sea, but not a particle of sand or gravel was found among them. Hence the inference that these depths of the sea are not disturbed either by waves or currents. Consequently a telegraph wire once laid there, there it would remain as completely beyond the reach of accident as it would be if buried in air-tight cases. Therefore, so far as the bottom of the sea is concerned, the practicability of a submarine telegraph across the Atlantic is proved."

Such a marvelous answer to Mr. Field's inquiries, of course, quickened the interest which had already taken possession of his mind, and which, after an interview with Prof. Morse, soon ripened into a determination to engage in the enterprise of laying an oceanic cable. Mr. Field was equally surprised and pleased to find that Mr. Morse had entire faith in the undertaking, and had avowed the faith many years before in his correspondence with John C. Spencer, Secretary of the Treasury. In a letter written August 10, 1843, Prof. Morse used the following language, alluding to the law governing electrical transmission : "The practical inference from this law is that a telegraphic communication on the electro-magnetic plan may with certainty be established across the Atlantic Ocean. Startling as this may now seem, I am confident the time will come when the project will be realized !"

Mr. Field now distinctly resolved that if he could get a sufficient number of capitalists to join him he would embark in an enterprise which, beginning with the line to Newfoundland, involved in the end nothing less than an attempt to link this New World to that Old World which had been for ages the home of empire and civilization.

The first person to second his audacious undertaking was Peter Cooper—not as a speculation, but as an attempt to perform a grand service to mankind. His name gave the enterprise a benediction. Moses Taylor, one of New York's princes, next gave his co-operating hand. Marshall O. Roberts followed, and, with the addition of Chandler White, and afterward of Wilson G. Hunt, all names familiarly connected with New York commerce, the "New York, Newfoundland and London Telegraph Company" was formed. The Governor and Council of Newfoundland entered heartily into the undertaking, and agreed to recommend to the Assembly a guarantee of the interest of 5 per cent. on £50,000 of bonds, a grant of 50 square miles of land, as soon as Newfoundland was telegraphically connected with the United States, and a further grant of 50 square miles on the completion of the connection with Europe, and £5,000 for a bridle path across Newfoundland along the line of the land telegraph.

Here, then, the enterprise was fairly launched. On the 8th of May, 1854, at 6 o'clock A. M., at the house of the counsel of the Company, David Dudley Field, Esq., New York, the stockholders met, organized, accepted the charter, subscribed one and a half million of dollars, and elected their officers. Mr. Peter Cooper was chosen President, Mr. White Vice President, Mr. Taylor Treasurer. Thus began a work which tested the strength, the courage, the perseverance of these men for 12 long years before success finally crowned the hopes of that bright May morning.

Under the engineership of Mr. Mathew D. Field, lately deceased, a brother of Mr Cyrus W. Field, the land line was immediately commenced. Six hundred men were employed. A track of nearly 400 miles long, and eight feet wide, had to be cut through the dense forest. Yet by August, 1855, the line was so far completed that the cable between Cape Ray and Cape Breton was attempted to be laid so as to meet the Nova Scotia lines. Mr. Field, Prof. Morse, Mr. Cooper, Gardiner Spring, Dr. Field, and many others were among the brilliant party who accompanied the engineers engaged in laying this first international ocean link. But the first cloud was then to break. A sudden storm came up. The brig bearing the cable became unmanageable, and when about 40 miles had been paid out the captain had to cut the cable to save the ship. It was laid successfully the following year, and worked steadily for nine years. The line from New York to St. Johns was thus completed at a cost of one million and a half of dollars, including the land line, cable, and bridle path.

The great work of laying a wire beneath the Atlantic now remained to be accomplished, and Mr. Field set sail for England to enlist both capital and engineering skill in its accomplishment.

In the work of laying the Atlantic Cable there was at once enlisted the enthusiastic attention of the great engineers of the world. Brunel, Stephenson, Bidder, and others took a deep interest in its success. Brunel took Mr. Field to Blackwell one day, and pointing to the Great Eastern's massive hull, which he was then building, as it rose from the banks of the Thames, said, "There is the ship to lay the Atlantic Cable !" It was prophecy, for without that ship the great ocean cables might have been still unlaid.

The most serious inquiry, however, yet to be answered, was as to the possibility of sending signals so far at any speed which would give the undertaking practical value. Faraday had discovered the law of electrical retardation under certain circumstances, which cast a doubt on such a possible celerity of transmission as to encourage the undertaking. To solve this, Faraday, Morse, Bright, Whitehouse, and others applied themselves with the utmost anxiety and care. It was at last conceded that ten words per minute was within the capacity of a 2,000-mile cable. This was deemed enough. Thus the way seemed clear. It was now a question of money, and ships, and engineering skill.

Of all that followed we need not speak. The world knows the result. The first cable attempted to be laid by the national ships "Niagara" and "Agamemnon," in 1857, was lost.

Undeterred, however, by a misfortune in which the whole civilized world sympathized, the attempt was renewed the following year, and the cable successfully laid. When the announcement was made that Europe and America were thus made one, the whole earth seemed with one accord to send up a shout of gladness. September 1, 1858, was set apart, by common consent, for public rejoicing. The day was one of the finest of the year, unclouded and beautiful. The demonstrations of joy that day found expression in grand illustrative processions, firing of cannon, ringing of bells, orations, and grand municipal and social banquets. It seemed as if the wedding day of the world had come. Amid the general rejoicing the City of New York presented to Mr. Field the freedom of the city in a box of gold.

But the joy was brief. Messages were sent by the cable from the first with difficulty. It was evident some great fault existed. We cannot stop to dwell on the causes which led to the final destruction of communication through it. Everybody remembers how De Santy sat week after week at Trinity Bay hoping to see the dying spark revive. But all hope fled. The cable was abandoned. Sullenness settled down on both worlds. One thousand pounds of Atlantic Cable Co.'s stock sold in London for £31 10s. and in New York $10,000 of the New York, Newfoundland and London Telegraph Company stock sold at auction for $10. The disappointment was deep, keen, bitter, universal.

After the first depressing effects of the failure had somewhat subsided, without, however, at all removing a general impression that the undertaking was impracticable and would not be resumed, Mr. Field, nothing daunted, commenced anew an effort to enlist capital in a fresh attempt. In doing this he had to travel constantly from continent to continent. By dint of sheer determination and personal hopefulness, capital was obtained, and, better than all, the Great Eastern was secured. A new cable was made, in which some valuable improvements were effected. In 1865 the great ship started on her journey, but the cable broke in mid-ocean. Strange to say, even this failure did not discourage the parties most deeply interested. Half the ocean had been traversed. All urged a new attempt. Another cable was made, and in 1866 not only was it successfully laid, but the cable of the year previous picked up in mid-ocean, in water over two and a half miles deep, spliced, found perfect, and put in successful use. Thus after 13 years of persistent energy, of pluck such as the world seldom sees, the two worlds were united never again to be severed. During all these years Mr. Field had labored without compensation, and risked everything on final success. Now came triumph and congratulations. At an immense banquet in England Lord Stanley, Minister for Foreign Affairs, expressed his deep conviction that "on the union of the two nations, more than on any other earthly thing, the future of civilization depends." Mr. Field, as the prime agent in accomplishing the telegraphic union of the two nations, was toasted over the cable, while the Chairman made the graceful acknowledgement that "to Mr. Field it is that we owe the practical carrying out of the idea which has borne such glorious fruit."

On both sides of the Atlantic civic honors of all kinds were bestowed, medals presented, and national congratulations given. John Bright said at the banquet at Welles's Rooms, July 1, 1868:

> "I rejoice very much at this banquet. I have known Mr. Field for many years. He has, by an energy almost without example, by a courage nothing could daunt, by a faith that nothing could make to falter, and by sacrifices beyond estimation, aided by discovery, and by science, and by capital, accomplished the grandest triumph which the science and intellect of man have ever achieved. In a speech in the North of England I took the liberty of describing Mr. Cyrus Field as the Columbus of the 19th century. If it be given to the spirits of great men in the eternal world to behold the great actions of our lives, how must the spirit of the grand old Genoese have rejoiced in the triumph of that hour, and at the new tie which bound the world he had discovered to the world to which, but for him, it might have been for ages unknown."

W. H. Russell, LL.D., the eloquent correspondent of the *Times*, wrote as follows:

> "Let who will claim the merit of having first said the Atlantic Cable was possible, to Mr. Field is due the inalienable merit of having made it possible, and of giving to an abortive conception all the attributes of healthy existence."

Lord Derby, Prime Minister of the British Government; the New York, Newfoundland and London Telegraph Company; the New York Chamber of Commerce; the President of the United States and his Cabinet, the American residents in Paris, and large bodies of men elsewhere, all vied with each other in recognizing the great service rendered by Mr. Field to the world. The United States Congress unanimously passed the following resolution:

> *Resolved, By the Senate and House of Representatives of the United States of America in Congress assembled*, That the thanks of Congress be, and they hereby are, presented to Cyrus W. Field of New York, for his foresight, courage, and determination in establishing telegraphic communication by means of the Atlantic Cable, traversing mid-ocean and connecting the Old World with the New; and that the President of the United States be requested to cause a gold medal to be struck, with suitable emblems, devices, and inscriptions, to be presented to Mr. Field.
>
> *And be it further resolved*, That when the medal shall have been struck, the President shall cause a copy of this joint resolution to be engrossed on parchment, and shall transmit the same, together with the medal, to Mr. Field, to be presented to him in the name of the people of the United States of America."

To some men similar honors would have been ruinous. Not so has it been with Mr. Field. He has enjoyed his success thoroughly and received his honors gladly; but nobody would suspect, as he walks down Broadway to his daily duties, that in that lithe, active, unassuming man, was one whose name was household through the world, and stands with Franklin, Morse, Fulton, Watt, and others, as one of the great benefactors of the race.

Mr. Field is now preparing for the last great work of laying a cable from San Francisco to China. That link is wanting to make the circuit of the world complete. It cannot be long delayed. America needs the connection, and we hope Congress will aid its accomplishment in the most emphatic manner. The year 1872 should see the United States and China so connected by telegraph as to quicken and identify the commercial interests of these two great nations.

J. D. R.

The Phosphorescence of the Sea.

Every one recognizes the beauty of the singular phenomenon that we call the phosphorescence of the sea, and has watched the track of foam and diamond points of light left behind as the steamer cuts the wave. For a long time the cause of the shining appearance was a puzzle to philosophers. But the naturalists finally came to the conclusion that it is produced by animalculæ which are excited to luminosity when the water is agitated. It was also shown that the phosphorescence is brightest, and the sparks most numerous, immediately preceding an atmospheric disturbance. Thus, the little animalculæ must be included in the long list of delicate organisms that feel the approach of bad weather. Prof. Dechrame observed this coincidence and has been dilligently studying the habits of the tiny creatures and their shining propensities. He tells us, as the result of his observations, that they are visible in the daylight with a glass magnifying about forty times. They are, under this magnifying power, of a lens-shaped form, and from seven to fifteen-hundredths of an inch in diameter. They are of a transparent nature, more diaphanous in the center than around the periphery of their little bodies. The specimens experimented on by the Professor lived in a bottle for several weeks, and became very brilliant when the water was shaken or stirred, or whenever a small quantity of exciting fluid, alcohol, or acid, was introduced into it. These infinitesimal barometers, when fully developed, attain the size of from two to four thousandths of an inch.

◆

The French System of Storm Maps.

Behind, or rather beside, the Pantheon, in Paris, at the corner of a street that runs toward the Observatory, at the far end of the Gardens of the Luxembourg, and in the ground floor and corner room, as if it were an American apothecary shop or grocery store, the traveler, curious in such things, will find a woman sitting at the receipt of custom, taking down subscriptions for the daily bulletin of the meteorological observations carried on at the Observatory. I have recently learned, however, that the task of making these observations is now transferred to the new observatory, of which M. St. Claire Deville is the learned and distinguished superintendent.

When we crossed the ocean in October, 1866, from New York to Brest, in the *Ville de Paris*, we knew that the passage would be stormy, for the time of sailing fell on the bad day of the weekly storm system of that year. And so it turned out. We got engaged in the southern rim of a tremendous "northeaster" just departing, like ourselves, from the States for England, and we sailed nine days in its company, sometimes gaining on it, sometimes beaten back by it, until one night, not having seen the sun for six days, we lay to in front of a lighthouse, not knowing where we were, only that we certainly were not where we should have been—off Ushant. When morning broke, the shore appeared. It was the coast of Cornwall. We turned, therefore, at a right angle, and steamed across the mouth of the English Channel, and arrived at Brest one day later than we should have been had we made Ushant Light.

This lost day permitted our disagreeable companion, the northeaster, who seemed utterly indifferent to our society, to go ahead; and then the sun came forth, and the beautiful and curious cliffs and monuments of Brittany, and the rare scenery of the port of Brest, remunerated us for the delay.

Had we been on a voyage from Labrador to Norway, we should have been on the northern rim of the storm instead of the southern; and it would have been a southwester instead of a northeaster, and have driven us forward, all the way, pell mell.

I was so curious to follow the subsequent course of this erratic monster, that, on my arrival in Paris, I subscribed to the *Meteorological Bulletin*, and got the back numbers for two weeks.

Looking on the chart for the day before we saw the English light—there, sure enough, was the front rim of our storm drawn in curved lines from north to south, and bellying eastward, over the northwest corner of Europe. The next day's chart showed it further advanced and raging into the North Sea; and each successive daily chart marked its position further and further east-south-east, until its form was broken up and lost between the Black and Caspian Seas.

The Winter I spent in part at Pau, in the Pyrenees, and every morning I had at my breakfast table the mapped climate of all Europe of the day but one before. And every week I had a new storm to follow, from its first appearance on the west coast of Ireland, to its disappearance three or four days later in the Levant, or across the Ural Mountains.

Sometimes there appeared signs of a disturbance in this regular march, which I could not comprehend, and then the order would be resumed and regularity maintained as before.

In St. Petersburg a similar storm map has been published for years, even better adapted for the student than the French. In England there was, until recently, a distribution of storm information, in advance of time, to all the seaports of England, by telegraph from Greenwich; but the labor and expenses were supposed to be inadequate to the results; the designer of the system, on whom it chiefly depended, became engaged in other scientific pursuits; and the daring fishermen and economical merchants of England were impatient of control. So it had ceased.

Along the stormy and dangerous coasts of the United States such a system would be of incalculable value, and ought to have been established by Government long ago. One wealthy merchant of Boston or New York, however, could by himself keep up an establishment of the kind they have at Paris until it becomes self-supporting—and not have to wait long for that to happen. The *Bulletin* of Paris is a quarto sheet of four pages; on the first, second, and third of which are tables of the state of the barometer, thermometer, and sky, the rain-fall and wind-force at all the places from which telegraph dispatches had arrived that day, and lagging dispatches of the day before.

The third page, kept permanently furnished with a map of Europe, printed in blue, shows on this map, but in strong black lines, the curves of barometric pressure, geographically drawn through or near the places from which the telegram of the day has come. These telegrams are studied in the evening, and thrown into curves, printed over night, and distributed in the morning. In Paris a man can see at a glance the condition of the atmosphere as it was all over Europe the day before.

The lines of barometric pressure are all concentric in a greater or less degree, because they show the sides of the great waves of air which are rolling forward over the surface of the earth, and pressing unequally on the innumerable barometers of Europe. Each curve is marked 700, 705, 710, 715, etc., meaning millimeters of mercury. In America we should mark them tenths and hundredths of an inch. Arrows also appear on the map, showing the direction and force of the winds.—*Old and New.*

A REVIEW OF SAUER'S TELEGRAPH STATISTICS.

Hon. C. C. Washburne, in a speech on the Postal Telegraph bill delivered in the House of Representatives December 22, 1869, says: "I have been greatly indebted to George Sauer, Esq., an American gentleman residing in Paris, and formerly United States Consul at Brussels, and more recently one of the promoters of the French Atlantic Cable, for many of my facts in regard to European telegraphy." Mr Hubbard, another advocate of postal telegraphy, acknowledges his indebtedness for European statistics to the same source, while to Mr. Sauer is also due the credit of furnishing much of the material for the speech of Hon. E. B. Washburne on the "Union of the Telegraph and Postal Systems," delivered in the House of Representatives in 1868. Thus it appears that Mr. Sauer's statistics have been the foundation, or tap root, of all the postal telegraph schemes which have been started in this country for the past three years. As the statements relating to telegraph matters of all three of the gentlemen who have derived their information from Mr. Sauer have been almost invariably incorrect, we have taken some pains to obtain Mr. Sauer's compilation, for the purpose of instituting a comparison between his statistics and those contained in the official reports. We have now before us the work in question, entitled

"THE TELEGRAPH IN EUROPE.
BY
George Sauer.
Paris, 1869;
Printed for Private Circulation."

The first 25 pages of the book are devoted to a history of "The Rise and Progress of the Telegraph," which, if not entirely correct, or particularly novel, is at least quite harmless. The succeeding 135 pages contain brief notes on the telegraph in various European countries, and are quite curious, statistically considered, for asserting in one place what they contradict in another.

MR. SAUER'S STATISTICS.

Page 174 contains the following table purporting to show the number of miles of telegraph wire in operation in Europe, together with the cost of constructing them:

Statement, showing the Mileage of Wires and Cost of Construction.

	Miles.	Expenditure.
France	70,330	$4,781,168
Belgium	7,444	441,199
Switzerland	4,612	414,186
Prussia	45,272	2,418,840
Bavaria	4,729	361,374
Baden	2,343	200,000
Wurtemberg	2,020	150,000
Other German States	2,000	150,000
Sweden	7,328	1,151,101
Norway	3,100	660,034
Denmark	2,302	530,000
Russia	44,823	5,200,000
Italy	26,832	3,000,000
Netherlands	4,290	696,128
Great Britain	85,000	13,000,000
Austria	32,000	2,000,000
Portugal	3,137	500,000
Spain	15,623	1,600,000
Turkey	26,558	3,000,000
Greece	4,000	600,000
Papal States	1,000	150,000
Total	394,793	$41,003,397

Average cost per mile of wire, $103 86.

According to the above table the cost per mile of line—poles and wire—would be about $300. As Mr. Sauer, however, acknowledges in his pamphlet that he has no information whatever in regard to the expense incurred in the construction of lines in Baden, Wurtemberg, Austria, Denmark, Russia, Italy, Portugal, Spain, Turkey, Greece, Hungary, or the Papal States, but simply

GUESSES AT THEIR COST,

and in some cases even as to their extent of line, we do not think the table referred to can be regarded as altogether reliable and authentic. Besides, we submit that it is not good guessing which estimates the cost per mile of wire in Turkey—where there are two-thirds as many miles of line as of wire—at $112; while in the Netherlands—where there is only one mile of line to four of wire—the official reports show that each mile of wire costs $140. Neither does it seem fair to estimate the cost per mile of wire in Austria at $62, while the official reports show that it averaged $157 in Sweden.

Page 176 contains a statement of the

AMOUNT OF BUSINESS DONE

upon the telegraph wires in Europe during the year 1868, which we reproduce below, together with a correct account of the same obtained from authentic sources:

Statement, showing the Traffic and Revenue of Telegraphs in Europe.

Countries.	According to Mr. Sauer. Number of Messages.	According to Mr. Sauer. Gross Receipts.	According to Official Reports. Number of Messages.	According to Official Reports. Gross Receipts.
France	3,599,182	$1,876 611	3,299,958	$2,013,763
Belgium	1,502,699	239,420	1,392,899	339,420
Switzerland	1,153,091	170,848	930,499	170,848
Prussia	3,344,650	1,335,000	*4,304,600	1,692,693
Bavaria	678,374	151,678	278,795	151,679
Baden	430,504	60,981	209,325	60,981
Wurtemberg	506,986	55,127	230,162	55,127
Sweden	503,062	191,281	409,916	193,934
Norway	330,000	120,000		
Denmark	348 690	70,314	264,091	70,314
Russia	1,600,000	2,200,000	746,000	2,280,341
Italy	2,320,271	912,025	1,578,677	911,047
Netherlands	1,496,544	199,087	1,047,823	338,791
Spain	550,000	600,000	472,094	313,022
Portugal	350,000	300,000		
Austria	3,000,000	1,000,000	2,394 432	1,390,195
Great Britain	6,000,000	1,600,000		
Turkey	1,200,000	474,300		
Greece	300,000	39,459	71,590	39,359
Total	29,336,814	$11,596,131	17,690,626	$9,610,646

Average tariff per message, according to Mr. Sauer... 39 cents
Average tariff per message, according to official report .56 cents

The expenditures for telegraphic service in the above countries in 1868 were $11,093,424, making the actual cost per message 63 cents.

No returns of the telegraphic traffic in 1868 have been received from England, Norway, or Portugal, and only partial returns from Turkey, the receipts in that country being $711,930 and the expenditures $832,775.

Thus, according to the official reports, there was an

EXCESS OF EXPENDITURES

for telegraph service over the receipts for messages in 32 countries in Europe, for the year 1868, of $2,066,042 and an excess of receipts for messages over the expenditures in five other countries of $662,419, showing a total loss upon the whole service of $1,403,623.

GENERAL INACCURACY.

With a few exceptions there is scarcely even an approximation to accuracy in any of the figures given by Mr. Sauer in the above table, and they have apparently been thrown together in the most careless manner.

The returns for France, Sweden and Denmark include the international messages *both sent and received, the latter also appearing in the reports of the countries in which they originated as sent, thus counting them twice.*

The returns for Belgium, Holland, Spain and Switzerland include the international messages both sent and received, as well as the transit, the latter being neither sent nor received in these countries, but simply permitted to pass through them on their way to and from neighboring States.

The returns for Bavaria, Baden, and Wurtemberg are strangely erroneous. The lowest rate for the transmission of inland messages in Bavaria is 25 cents, and in Wurtemberg 14 cents, while the international and transit are higher; and yet, if we divide the amount of money received by the number of messages reported by Mr. Sauer to have been sent, we should find the average tolls in the former country 22 cents, and in the latter 10 cents.

WHICH IS RIGHT?

Mr. Sauer states that "2,320,271 messages were transmitted in Italy during the year 1868 exclusive of Government messages, the number of which is excessively large."

The official report, on the contrary, states that only 1,578,677 private and 191,744 government messages were transmitted in that country during the year, so that if the latter were included in the returns the number would still be half a million less than Mr. Sauer's figures.

On page 145 Mr. Sauer says, "We have

NO INFORMATION

regarding the number of messages worked off annually" in Turkey, and yet in the general summary he puts the number down in round numbers at 1,200,000.

GREAT BRITAIN.

In the detailed table for Great Britain and Ireland Mr. Sauer states that he has no returns for 1868, and yet, in the summary, the number of messages transmitted is set down at 6,000,000, and the receipts at $1,600,000, making the cost per message 26 cents. A moment's reflection, however, would have shown Mr. Sauer that in this case he had

OVERSHOT THE MARK,

for if messages were sent in Great Britain in 1868, when the lines were under private management, for 26 cents each upon an average, the tolls since they have come under government control must increase the cost, as the lowest rate now is 25 cents, and the charges for extra words will bring the average up to at least 30 cents. No returns of the telegraphic traffic in that country for 1868 have been received, but the receipts for 1866, the last year of which any statistics have been published, amounted to nearly $3,000,000, which would make the average cost per message about twice as much as stated by Mr. Sauer.

GREECE.

On page 157 Mr. Sauer says, "The number of messages transmitted in Greece during the twelve months ending 31st December, 1868, is stated to have been 77,441," while in the general summary he puts them down at 300,000, thus reducing the apparent cost per message from 50 cents to 13 cents.

DENMARK.

In the detailed table for Denmark the receipts for messages are stated in one place as $61,485, and in another as $70,314.

SPAIN.

In the detailed table for Spain Mr. Sauer gives the receipts for [illegible] messages at 1,689,258 pesetas, or $270,281 28, and in the summary at $600,000.

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*These figures represent the traffic of North Germany, and include Prussia, Anhalt, Bremen, Brunswick, Hamburg, Hesse, Lippe, Lubeck, Mecklenburg-Strelitz, Aldenburg, Lauenburg, Reuss, Saxony, Saxe-Altenburg, Saxe-Coburg and Gotha, Saxe-Meinenger, Saxe-Weimar, Eisenach, Schaumburg-Lippe, Schwarzburg-Rudolstadt, Schwarzburg-Sonderhausen and Waldeck.

PORTUGAL.

In the detailed table for Portugal the number of messages transmitted in 1867—the last year for which he has any returns—are given at 134,454 and the receipts at $90,941, while in the summary he puts the number of messages down at 350,000, and the receipts at $300,000.

FRANCE.

In the detailed table Mr. Saner gives the receipts in France for 1868 at $2,017,364, and in the general summary at $1,876,611.

MR. SAUER'S INGENUITY.

In the detailed statement Mr. Saner puts the receipts in Switzerland for 1868 at $184,236, and in the summary at $170,848. *In the one case, by reducing the amount of the receipts the apparent average cost of each message is lessened, and in the other, by increasing them, an apparent profit is shown in conducting the business.*

RUSSIA.

In the detailed table Mr. Saner gives the receipts in Russia in 1867—the last year for which he has any returns—at $1,967,115, and in the summary at $2,200,000.

SWEDEN.

In the detailed report he gives the receipts in Sweden as $193,304, and in the summary $191,281.

NORWAY.

In the detailed report Mr. Sauer gives the number of messages transmitted in Norway in 1867—the last year for which he has any returns—at 309,604, and the receipts at $111,135, while in the summary he puts the number of messages at 350,000, and the receipts at $120,000.

PRUSSIA.

In the detailed report for Prussia he gives the receipts in 1867—the last year for which he has any returns—at $1,188,934, and the number of messages transmitted 3,093,919, while in the summary the receipts are set down at $1,335,000, and the number of messages transmitted 3,544,650.

AUSTRIA.

Mr. Sauer's detailed statement shows that no returns have been received by him from Austria, and that the figures contained in his general table, which refer to that country, are purely conjectural.

WHAT HE TRIES TO PROVE.

The effect of Mr. Saner's singularly erroneous table is to show that messages were apparently transmitted in Europe at an average rate of 39 cents, while the official returns prove that the tolls actually averaged 56 cents, and the cost of transmission 63 cents.

GOVERNMENT TELEGRAPHY.

We do not propose to enter into any extended criticism of Mr. Saner's arguments in favor of governmental telegraphy, but we cannot avoid showing the inconsistency of his assertion that the telegraph in France is more extended and more generally employed than in England, when, according to his own table, 29,000,000 people in the latter country possess 85,000 miles of telegraph wire, and send annually 6,000,000 messages, while 38,000,000 in France possess only 70,330 miles of wire, and send but 3,500,000 messages. When we add, further, that according to Mr. Sauer's table the average cost per message in England was 26 cents, and in France 53, the

UTTER INCONSISTENCY

of his deductions will be still more apparent.

THE PROOF UNSATISFACTORY.

Mr. Sauer says "the steady and continuous progress in France as regards the extension of wires and the augmentation in the number of stations, has always been made without regard to the numerical population of small towns or villages. The French Government undertake these extensions without reference to whether the working expenses would be met, or whether, in absence of all probability of obtaining a sufficiency of public business, a loss would be incurred in creating new lines or opening additional stations." But the superiority of France in regard to the number of telegraph offices maintained does not seem to be established by Mr. Sauer's own table, which claims only 1,700 stations for the whole empire, while the United States, with a less number of inhabitants, has three times as many.

LIMITATION OF GOVERNMENT SUPPORT.

Neither does his rose-colored account of the liberality of the French Government in building lines and opening offices seem to be sustained by the highest authority, for M. Pinard, the Minister of the Interior, to which department the telegraph belongs, in a communication to Gen. Dix dated Paris, [January 7, 1868, says:

"In the principal towns of Departments, where the service answers the *political and commercial* exigencies of the general public, the Government bears all the expenses of the establishment and working of lines.

"In the principal points in the Arrondissements, where the service answers the needs of the Government and those of the immediate localities as well, the lines are established by the Government and worked under its direction, *but the offices are furnished by the local authorities.*

"In the chief towns of the Cantons, however, where the telegraph serves almost exclusively the local interests, *the people of the villages contribute on the one hand to the construction of the lines, and on the other, to their working.*"

The arrangements with local communities in France are carried out thus: In cases where small towns or villages want telegraphic communication to be established, and there is not sufficient work to cover expenses, the Administration charges the municipality $40 per mile for constructing a new line, and $20 per mile if only a new wire is to be added to poles already in use. The town provides the office rent, furniture, and the clerk, the latter having generally some other employment, such as schoolmaster or town clerk. The Administration furnishes the apparatus and appurtenances, and allows to each office a certain sum on every message sent or received. These commissions are as follows:

To municipal offices:	
Private forwarded messages	3 cents
Private received messages	2 cents
Delivery to receiver	2 cents
To offices worked by auxiliary agents:	
Private messages forwarded and received,	2 cents
To offices worked by Administration clerks who have undertaken to defray the cost of delivery:	
Private received messages	2 cents

If the work of the office renders assistance necessary the Administration provides what is called an auxiliary clerk, and a female is usually chosen to fill this post. These items appear in the accounts of the Administration under the ordinary headings of Receipts and Expenditures.

The extensive premises occupied by the headquarters of the Telegraph Administration at Paris belong to the Department of the Minister of the Interior, and as the telegraph service is a branch of this Department, they have no rent to pay for them. Their annual rental value, at a moderate estimate, is not less than $30,000.

Notwithstanding all these economical advantages, however, the telegraph service was conducted in 1868 at a loss of $569,817, the tolls charged being nearly twice the average rates for similar distances in the United States.

On the 1st of November, 1869, the tolls upon internal messages were reduced to 20 cents to any part of France—a reduction of 50 per cent.—10 cents being charged between towns in the same Department.

Although it would be possible to send a message a distance of six hundred miles within the limits of the country, yet there are very few messages which go even one-half as far, the average distance that dispatches are transmitted in France being less than one hundred miles.

Thus, the average rate per mile in France is 2 mills for inland messages, while a higher rate is charged upon international—the tariff from Paris to London being 60 cents. In the United States the average rate upon all classes of dispatches—except night messages—is 1 9-10 mills per mile, and the tariff upon the latter class is but one-half of these rates.

Although the present rates in France are higher per mile than in the United States, and a private company could manage the business profitably at the tolls imposed, we have no doubt that under Government control the deficiency for the present year will largely exceed that of 1868.

THE OBJECT OF MR. SAUER'S BOOK.

The apparent object of Mr. Saner's book is to prove the great superiority of the governmental over the private control of the telegraph; and while we should regret to be compelled to believe that in order to do this he would purposely misrepresent the facts, yet it is difficult to comprehend how he could accidentally fall into so many errors, the tendency of which are all in that direction.

◆

Weather Sheets.

An article thus headed has caused to be sent us a daily weather sheet, issued from the W. U. Tel. Office, Cincinnatti, showing a progress towards the European systems quite unexpected to us. In a capacious sheet are located in their proper geographical points of distance and direction, the principal cities from Halifax to Omaha, and from Saginaw to Havana. These are each represented, 1. By a simple circle when clear and windless. 2. A circle with arrow pointing in the proper direction when wind is noted. 3. The circle darkened when cloudy. 4. Bearing the mark *S* when snow is reported, and *R* when it rains.

This chart is quite interesting, and gives a curious idea of the varying currents of the air, and the weather at different localities. Thus, at Natchez the wind is east, weather clear; New Orleans, wind north and rain; Mobile, wind southwest and cloudy. All this is seen in such a relation on the sheet as to aid inquiry and provoke investigation as to the causes of variance within so narrow a circle. At St. Louis, Nashville, and Chattanooga, forming a straight line to the Florida coast from Central Missouri the wind is at each place in the same direction and the weather clear. In a line a little further north and east—embracing Louisville, Cincinnatti and Indianapolis, the wind is in the same direction as at Nashville, but weather cloudy, while right above them Chicago turns its back and shows the wind directly opposite and snow. All round the sheet there seems mingled peace and war, the arrows shooting into each other or turning tail on each other in the most mysterious contrariety. Fortress Monroe shoots at Weldon, S. W., Weldon shoots at Richmond due N., Gainsboro' shoots at Weldon S. E., indicating a centre from which the wind apparently rises. We expect now to see progress in this direction. The Government, usually instigating such matters, must take a back seat. Cincinnati is ahead. The sheet before us is numbered 115, showing that for four months these reports have been given to the public. All hail, Porkapolis!

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

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JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, APRIL 15, 1870.

Electric Forces.

There is no fact connected with the electric agencies by which distant communication is secured more suggestive than the minuteness of the power by which it is sustained. To project a ball at a distant ship with certainty of aim, to blast the sunken rock that impedes navigation, to impel the giant ship that splits the storm with its defiant bow, forces are presented to the eye which bear some natural comparison with the work accomplished. But when a message has to be sent thousands of miles beneath the ever fretting sea, from one continent to another, force seems ignored. We look in vain for any machine hissing with a vigor such as the mind deems necessary to eject the electric current from America to Europe quick as the sunlight comes to the earth. There is even an absence of the usual forces for communication upon the land, where nitric and sulphuric acids, zinc and mercury are busy in numerous cells brewing the electric fire. The power employed bears more truthful comparison with the action of the brain wherein human thought is evolved. The thought may be one which shall change the destinies of a nation; it may be the sweetest idyl that ever warbled from angelic lips; but both come from within the dome of a brow notable only for its repose.

The battery which operates the Atlantic cable is composed of five cells, although for some time it used only one. Each cell is composed of a glass tumbler, a small disc of sheet copper and a similar one of zinc, a few pellets of sulphate of copper and moist sawdust filling the tumbler. This is all. It has no smell. A spoonful of water upon the sawdust now and then is all it needs for support. It seems insignificant and powerless, yet does its work efficiently and well. The French cable uses only seven such cells, although twice as long as the other.

We have before us, as we write, a battery which was used to transmit a message by the Atlantic cable—the minutest, we presume, ever employed. It has a fascination to us inexpressible. It is composed of a simple gun cap soldered to a piece of copper wire, and a narrow strip of zinc. These, with a drop of water from the ocean, were all the forces which were needed to send a message from continent to continent. Here is a sketch of its actual size:

Had the ocean drop been a tear, it would have generated the same current which thus thrilled between two worlds and made them one. Were we disposed to moralize on the salt of this tiny battery and its mysterious agency, we might be excused did we regard it as typifying the power of sorrow which touches the universal heart and makes it throb. It is the alembic of the world's deepest and most omnipotent emotions, and yet may find its rise in the stopping of a single pulse, in the quenching of a single life.

This tiny battery has in it, indeed, a vast moral. We despise the lesser forces of our lives, and measure our influence by an unwise disparagement. From these, however, when true and pure, come the sunlight and the efflorescence of the earth. Let us hold our light high and honored, however small may be its flame. It may reach the radius of another light, and help the dawning of a brighter day—not to ourselves alone, but to thousands who never knew us. A single kind word has ere now planted a seed that has burst its blossoms upon the "infinite meadows of heaven."

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What We are Coming To.

"A physician in London has invented an electrical machine with which he can make the human body entirely transparent. He puts you between him and the light, and then he can examine your interior as plainly as if you were made of glass. The advantage of this is manifest. You have the stomach-ache, say: the doctor lights you up, sees that ache fooling around in there among your works, and then he goes for it."—*Exchange.*

We have had several intimations of a like character during the last few years, and have been exercised a good deal as to the result of such a capacity of inspecting our interior arrangements. No doubt it would be a grand aid to medical and surgical science. But it would be a most frightful instrument in the hands of dyspeptics and hypochondriacs, and would, we fear, keep up a perpetual alarm. They would be chasing every spoonful of gruel and every crust of bread to see if they were properly performing their office. It would get to be a common household cry, "light me up!" and long noses would be inspecting disrobed bodies with all the familiarity of a family microscope. Indeed, it might become a parlor amusement! Only to think of such a state of things is enough to alarm any sober-minded man out of his self-possession. We certainly desire that surgeons may be able to trace through these wondrous organizations of ours the causes of suffering and death, but we feel like begging that no instrument be devised by which sad-faced men and sighing women may be able to chase through their lean and gaunt carcasses every pill they swallow and every cup of tea they drink.

◆

Gen. Washburne has been authorized to present his postal telegraph scheme to Congress by a bill on the terms of which the Select Committee on that subject have agreed.

We inclose, with this number of the Journal, a circular respecting the proposal to present a testimonial to Prof. Morse. The nominations of the Committee may be imperfect. These can be corrected. Let every one regard himself a committee of the whole to do his share in the work proposed, and do it at once.

◆

Telegraph to the Pacific.

Mr. Somner in the Senate, and Mr. Dawes in the House, presented, April 14, a memorial from Mr. C. W. Field, asking Congress to charter a company to connect the United States and China by submarine cable. Mr. Field offers to deposit $100,000 with Government as a pledge of the earnestness with which he enters into the project, and his assurance of success, to be returned when the line is completed. It is the last and longest link in belting the globe. The cable will be 8,500 miles long, and is proposed to be laid from San Francisco by way of the Sandwich Islands and Japan. The capital proposed is $10,000,000 in gold, to be all paid up in one year, and the cable laid within five years from the passage of a charter under which the company may be organized; the United States Government to have the prior right of transmission, and the free use of the cable up to $500,000 per annum of ordinary tariff charges. No exclusive right is asked.

It can scarcely be doubted that this last great work will be accomplished, either through the plan now proposed, or some other. We have great faith in the pertinacity of Mr. Field and his power to enlist capital in his purposes. We certainly wish him abundant success in what must be his closing telegraphic work, and which must forever identify his name with the girdling of the globe.

◆

The British Telegraph Delays.

The following letter, written by a country postmaster to a friend in London, has been published:

"Dear Sir: You say at foot of your note, 'You Government people don't seem to manage the telegraphs very well.' I will tell you why. If there had been a few Odgers in the House of Commons probably the truth would have been known generally before now. Take my case as a sample. I am postmaster at ——. I live in my own house; that is, I bought it and paid for it, but in December last it was taken possession of from top to bottom by three or four fellows armed with authority from Mr. Scudamore, and of course to offer objection to their doing as they liked would have been at my peril. They forged an iron band around one of my chimneys to strain the wires upon, causing a great annoyance all over the house, and rendering the bedroom immediately underneath nearly useless by the most melancholy of moaning noises caused by the vibration of the wires. The few cracked slates on the roof left for me to repair is only a trifle. My room, fitted up at my own expense for postoffice business, is in the meantime being pulled to pieces, and altered to a plan over which I have no control. All I can do is to 'grin and bear.' I am now made responsible for the honesty and good conduct of a strange man and boy forced upon me in my office, where a very large amount in cash and stamps is constantly in circulation, and for which I have to give securities. I have, I believe, over 100 4to pages of closely printed instructions to study and make myself master of. Some members of my family are desired to give up a few hours a day to learn to use the instruments, so as to assist in doing the work, and thus relieve the poor telegraphist, who has now about fourteen hours a day in the office.

"I should have no difficulty in largely multiplying items on this side of the account; but perhaps enough has been said for the present, and I will now show you the *per contra*. It consists in this: that all messages are to be paid for in postage stamps, and thus there will be an increase in the sale of stamps, bringing in an increased amount in poundage to postmasters. As the poundage on the sale of stamps is 1s. on the £1, this increase in my case will probably yield me 9d a week! The single messenger at the office is of course not ubiquitous, and can it be fairly expected that on the arrival of half a dozen messages for east, west, north, and south—two or three miles apart—the postmaster is going to send members of his family without any power to remunerate them for their trouble? Not if I know it. Messages must take their turn, and an impatient public must bide their time.

"Indignant Postmaster."

OFFICIAL STATEMENT.

Western Union Telegraph Company.

FEBRUARY.

	1869.	1870.
Receipts	$575,249 07	$621,416 59
Expenses	354,855 72	380,780 20
	$220,393 35	$140,636 39

◆

TARIFF BUREAU.

Semi-Monthly Circular.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
APRIL 15, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since April 1, the date of the last tariff order. Please note them in your tariff book.

NEW OFFICES.

40. Athens, New York.
267. Auburn, Ala.
312. Cherokee, Alabama.
425. Clear Fork, Missouri.
253. Deputy, Indiana.
456. Edwardsville, Kansas.
40. Feurabush, New York.
294. Lime Kiln, Alabama (printed in book).
140. Phillipsburg, Clarion County, Pennsylvania.

OFFICES CLOSED.

Medford, Long Island.

GENERAL INFORMATION.

Charlestown, W. Va., square 163, is in Jefferson County. Charleston, W. Va., is in Kanawha County. Care should be taken in receiving messages for these points. There is no office at Charleston, but messages may be taken for that point and sent and checked to Gallipolis, Ohio, where they will be mailed. Tariff to Charleston will be the rate to Gallipolis, with three cents additional for postage.

RATE TO SAN FRANCISCO, CAL.

Referring to reduction of rates to San Francisco, Cal., and offices on direct line between San Francisco and Omaha, as per Tariff Circular in JOURNAL of March 1, it must be understood that the currency rate will be collected on all messages paid for at points east of Salt Lake, whereas the gold rate applies only upon business paid in the Pacific Division. Directions for checking, as per Tariff Book, remain unchanged.

WILLIAM ORTON, President.

◆

TO BOSTON AND RETURN.

The element of labor does not enter into the modern idea of success. Surrounded, especially, by the atmosphere of large cities, and the dubious arts by which vile men become rich, the impression becomes common that it is the offspring of cunning, and the record of selfishness and speculation. Many fortunes are no doubt thus accumulated, if that indeed be fortune which is accreted in such a way. Yet it stands as true to-day as ever that the true avenues are by toil, by care, by conscientious administration of trusts, and by patiently and honorably doing right. The value of success in such cases is that it is not personal but communal. It is a triumph which lifts all others in greater or lesser degrees with the chief factor in its accomplishment. One man's fidelity is the seed root of fidelity in others.

This thought was exemplified to us in a recent visit to Boston. Many years had elapsed since we had walked its crooked streets, and we had no purpose in seeing it again except to secure one day's respite from the tread mill of our daily work. But we were compensated beyond our expectations. At the risk of appearing personal, we will briefly say how.

After an active superintendence of nearly a quarter of a century, it is as natural to us to seek the wire side of the cars as to others to seek the shady side. We have a brotherhood in poles which keeps up still the old watch. We wanted to see if all stood straight like honest poles which had a solid bottom to them and a future. Then, with a jealous look out at the glass caps, we tried to find any fragmentary members, lifeless, headless, or cracked. But we could not find the first opportunity to carry a complaint to headquarters, and so got no chance of professional credit for the severity of our inspection. No, there stood a line of telegraph against which a green-eyed editor could not wag his tongue. We almost wished that there had been just one pole on a bend to have relieved the perfection which made every stick seem stuck up with conscious completeness. We wanted to feel like Parker, who was comforted when he found that Washington once swore. We wanted a similar comfort in taking the Superintendent down a peg by the chance of assuring him of some defects in his district. But nothing helped us. Even the wire seemed all strung with irritating precision, every one of them on a symmetrical and uniform bend. Everything visible outside testified to a most careful supervision. It was the more marked because as March comes with its petulance and storms, its sleets and snows, telegraph lines are excusable if they show marks of the elemental skirmishes through which they pass.

In Boston. Bitter cold, a savage wind blowing. Weather much modified by a splendid chop and bohea. No poles to be seen. Away up in the sky the wires lead hither and thither with no certainty of direction, but out of the way of even kites, for they seemed blessedly ragless. Not even a hoop skirt straddled the "highway of thought." Was it a literary thought that left the streets poleless, and carried the wires up to Emersonian heights? But here we are in the seeming centre of the hub. Innumerable wires rain down from the housetops into innumerable windows. Here is a telegraph sign: "Western Union," beside where we stand with our nose blue in the cold wind. There is another across the street. Yonder is a third in a bend of the building where the postal service goes on. A fourth wishes us a quiet good morning a few paces off. And here, under the protection of a massive lamp must be the "Central Office," for the doors are wide and the entrance inviting. And so it was. A large vestibule clean and convenient, at the desks in which a number of keen eyed men tried their powers of condensation; four small windows, at which four clean-washed, pleasant faces watched and smiled and waited; a remote sound of tick coming down the walls, and boxes going up, assured us we were at headquarters.

In some respects the Boston central office excels most of those we have seen elsewhere. We say this without the least disparagement of any other. It is like all others in that it bears the handmarks of its head throughout. Look at him; his well brushed hat, his well shaved jolly face; his neat clean neck gear and jaunty pin; his square-toed, well blacked boots; his quick, sprightly air; and then go through this den of his, and say if it aint just such a one as he might be supposed to keep. The floors are all clean; no loose papers, those scraps that torture sight and disturb temper, about the floors; no old soldiers; no smell of smoke, except from the wooden fires which the insolent Boston winds drive back into the faces of men too patient to fret at them. Everything is in place, everybody is polite, and though all busy, it seems as if a game were in progress, in which everybody hopes everybody else will win. How could we help adopting our old plan, and, with a touch of the enthusiasm of old times, shake hands with every one of them? We did so, and enjoyed it. It restored to us for a moment the good young years we shall never see again.

We had a good chance to see the benefit of the new style of operating tables, which, being separated into four by thick glass frames, crossing in the center at right angles, unite and yet separate. The sounds do not intermingle, and yet operators sit side by side and face to face. They give a cheerful, elegant look to the room. They add to the pleasure of labor, for the mind takes tone from all such surroundings. They give evidence of some mind, which, while it exacts labor, intelligently provides the conditions by which to aid in securing its best results. The Boston main operating room is a most cheerful, clean, well appointed office, with as pleasant a set of faces round its tables, and with hands that can give as good a fraternal grip as any we have met.

The room of the ladies' department is equally cheerful, orderly, and convenient. We might have shaken hands with the ladies there also, but we didn't. We are modest.

The battery room, however, was the crowning feature. We usually expect a battery room to be infinitely mean and distressful. Here, however, was a capacious garret, with a clean floor, with no drastic smell of rotting wood; with no wires dangling round from beam to beam; with no immense batteries long drawn out on dirty scantling, or buckets of used fluids scattered round the room. The floor was clean as a good housewife's kitchen; the air was clear and untainted; the batteries were small, neatly arranged, bright, and connected by wires which reached them by lines from the entrance which led to the radiating tower on the roof, as symmetrical as the wire board of Chickering's pianos. The battery-keeper, John Hutchinson was like his room, clean and careful, and we lifted our hat in unconscious respect to a redemption so great.

But the tower! Ah, Buell, here is some of your work! It is most excellent. How true every wire runs to its place! What a vast number of them! What immense labor and what cost secured all this wonderful order! A Company which permitted it cannot be stingy. It is the very luxury of order.

But this won't do. We must be gone. Does all this pay? Is there any success connected with these arrangements, with this *corps d'esprit*, with this unwearied vigilance? Much; everything. The fifth Eastern District is an honor to the Company. Its wires are all busy; its lines all in order; its men all content, industrious, and intelligent. Success to such management is a necessity. It is the legitimate harvest of seventeen years of unchanging, intelligent, unselfish administration, as well as of the executive policy which encourages and sustains it.

There is one feature in Boston too notable to pass unnoticed. It proves the power of personal influence fairly earned. In every one of the many Railroad depots may be found a neat, convenient Western Union office, usually attended by a lady, where passengers may leave despatches without fear of losing trains. With each of the twenty railroads in the fifth district the Western Union Telegraph Company have contracts. In every large hotel in Boston an office is established. We visited several of these, and found the Superintendent everywhere respected, and a desire apparent to serve him. It caused us no wonder. It is the legitimate reaping of faithful sowing. Fidelity commands honor everywhere. A Company served by such men cannot be crushed. Such men write success so high up on the wall that the letters remain uncovered forever.

We have much more to say, but cannot. All hail, Boston! Good bye. We kiss our hand to thee, Milliken, to thee Smith, to thee Charlie! *Au revoir.*

◆

A new kind of electric magic-lantern has recently been constructed by Mr. Ladd of London, which shows not only the optical images, but also the spectrums given by the different metals placed in the electric arc. The apparatus contains two bisulphuret-of-carbon prisms, and an arrangement of lenses, which enables the operator to use it both as a magic and spectroscopic lantern. In all likelihood it will be generally used to illustrate public lectures.

Telegraphers' Mutual Life Insurance Association.

ASSESSMENT NO. 12.

E. C. Cook,
S. B. Gifford,
A. B. Waite,
D. Leary,
D. L. Pike,
E. Powell,
A. J. Schell,
E. W. Taylor,
J. C. Kelly,
D. V. Perris,
J. D. Stone,
W. H. Hill,
George Chivvis,
H. S. Smithers,
O. M. Gay,
W. Holmes,
C. G. Merriwether,
H. C. Beckwith,
A. G. Martin,
C. W. Moore,
C. L. Deforest,
E. W. Mason,
S. J. Hoffman,
E. F. Ludwig,
D. J. Ludwig,
C. A. Thomas,
John Weuzel,
E. D. Sanford,
W. Sanford,
Timothy Cream,
J. Mitchell,
G. W. Anderson,
I. M. Worden,
W. H. Fessenden,
John F. Myers,
R. S. Raymond,
E. Rider,
George S. Shepard,
W. J. Denver,
Henry Denver,
F. N. Seibert,
D. R. Downer,
A. R. Brewer,
G. W. Roberts,
T. Southard,
P. H. Morris,
A. S. Downer,
A. H. Adgate,
G. K. Wood,
A. R. Ingraham,
F. P. Lentz,
W. H. Hoyt,
A. S. Brown,
C. F. Segelken,
J. M. Onten,
Libby Fryer,
W. J. Bodell,
W. J. Dealy,
S. H. Edwards,
Frank C. Ward,
E. L. Catterfield,
Lizzie H. Snow,
A. F. Swan,
H. C. Fardon,
W. C. Chapman,
William Connor,
Geo. F. Durant,
Alice A. Durant,
Joseph Beach,
J. H. Townshend,
F. A. M. Eyster,
B. F. Esley,
S. H. Lathrop,
R. W. Marriott,
P. Collins,
W. F. Shiebler,
John K. Calvert,
T. Dolan,
Andrew Neilson,
F. J. Grace,
H. A. Clute,
W. D. Sargeant,
A. W. Campbell,
T. P. Scully,
A. W. Pearkes,
A. M. Ogle,
C. H. Stancliffe,
Sophia Rogers,
James Cooper,
G. H. Grace,
J. C. Noyes,
A. J. Lombard,
J. H. Swift,
A. S. Adams,
Ed. Curran,
C. F. Loomis,
H. H. Henry,
A. H. Kanode,
D. D. Kelly,
C. L. Chase,
W. C. Havens,
H. H. Ward,
B. Clark,
A. D. Forbes,
W. F. Muchmore,
Abram P. Eastlake,
James Merribew,
William Carley,
C. O. Rowe,
S. L. Gilson,
John A. Wright,
L. E. Atwater,
Thomas R. Fox,
Robert Wilkinson,
Park Fitchett,
S. K. Rupley,
Ira A. Manley,
Albert Baur,
Calvin T. Sellers,
D. P. Livermore,
W. H. Stiegelmaier,
Sam. Ward,
Leonard Read,
W. G. Jamieson,
A. K. Burroughs,
C. Oscar Blake,
Isaac M. Purdy,
James R. Moon,
John B. Page,
J. Feary,
Andrew Smith,
Katie Howe,
B. B. Adams, Jr.,
Dwight B. Case,
Henry L. Barber,
Fred Fairchild,
B. D. Hubbard,
J. M. Fairchild,
David McDonald,
R. Cunningham,
A. H. Watson,
S. S. Thompson,
Hannah S. Brower,
G. M. Reynolds,
Charles E. Case,
James Miller,
Warren H. Moake,
N. B. Topping,
Benj. Stevens,
A. B. Chandler,
H. F. Thurber,
H. F. Makepeace,
G. A. Brown,
Mattie S. Smith,
R. H. Woodward,
John Doran,
Marcus A. Erwin,
John A. Conley,
A. S. Parmele,
C. L. Negley,
S. A. Jessup,
C. S. H. Small,
Carrie A. Hinds,
Henrietta Dieckman,
J. White Kelly,
Robert Morton,
J. B. Tree,
D. D. Forbes,
W. Ferguson,
C. L. Snyder,
J. D. Thurston,
J. W. Smith,
O. K. Newton,
C. E. Higdon,
J. C. Hall,
G. T. Williams,
J. W. Sherwood,
M. F. Seymour,
A. E. Brown,
T. A. Graham,
Eugene A. Coal,
T. J. Tobin,
N. B. Ross,
W. W. Shock,
Geo. O. Smith,
C. E. Moody,
W. A. Boyd,
A. Kern,
C. Sanback,
W. J. Lawler,
W. Brittain,
G. A. Clark,
J. D. Dunning,
F. L. Webb,
J. B. Watt,
W. T. King,
C. L. Lamb,
J. C. Mattoon,
L. C. Taylor,
P. Callahan,
W. W. Smith,
M. C. Newman,
F. A. Armstrong,
E. C. Armstrong,
C. R. Lane,
W. Stonebach,
A. H. Graham,
J. E. Hadley,
D. W. Warner,
J. F. Stephenson,
H. H. Scobell,
C. Selden, Jr.

ASSESSMENT NO. 11.

D. J. Willis,
James T. Maxwell,
F. A. Eyster,
David McDonald,
George D. Butler,
Thos. W. Russell,
A. J. Burton,
J. J. Calahan,
J. M. Worden,
W. N. White.

◆

Richard A. Schutt, well known by operators on the Hudson River Railroad, New York, Troy, and in the West as a skilful operator, died suddenly in Clinton prison, Dannemora, N. Y., on Monday morning, the 6th instant. This ends the life of a young man of good natural abilities and of genial qualities, but without moral restraints, who, by dissipation, and the dishonesty to which it drove him, ruined himself, and, both in the manner of his life and the place of his death, has been a sorrow to the profession. Yet many will, as we do, regret to hear of his decease. We hope the example will not be lost. If there is a vocation on earth which more demands strict sobriety and character than the telegraph, we do not know it.

◆

Vicksburg, Miss., April 2, 1870.

Editor "Journal of the Telegraph":

Dear Sir: Please decide this question. Are managers allowed to deliver "half-rate" messages, under any circumstances, until the next day?

Yours, respectfully,
Vicksburg.

Answer.—No.

◆

Crestline, Ohio, March 22, 1870.

Mr. J. D. Reid:

Dear Sir: You ask members of the Telegraph Insurance Association for their views as to the limitation of amount to be paid to heirs of deceased members. I would like to see the amount fixed at $1,000 rather than limited to $500. The latter figure, in these days of rival Life Insurance Companies, hardly satisfies the idea of the early, earnest members of the Telegraphic Life Insurance Association, who desire to look forward to it realizing to their families something substantial in the way of life insurance.

As the benefits of the Association become apparent every day, I think there is no doubt that it will soon reach a fixed, regular-paying membership of one thousand. This would be a very satisfactory sum to adopt as the amount to be paid to heirs of all deceased members.

The simplicity of our Association is one of its most commendable features—a member dies, and we know we have a dollar to pay—just this, and nothing more. Why not preserve this one dollar rule, and, if the assessments in time exceed the $1,000 to be paid at the death of each member, let the excess be set aside as a fund to accumulate, the interest upon which could be used to defray any increased expenses of the Association and to lessen the future assessments on members, or to make good any deficit in the $1,000, resulting from delinquent members, at any time.

Operators, repairers, messengers, and, in fact, every person connected in any way with our business, should be admissable to membership in the Association; and, while it would not, perhaps, be entirely just to accept an applicant who was at the point of death, it is charitable and brotherly to subject none to a strict physical test for membership, if they are known to be able to pursue their ordinary occupation.

Yours, truly,
Henry W. Wynkoop.

[For the Journal of the Telegraph.]

UNDER THE VINES.

BY C. H. H. PANNELL.

I.

She lies 'neath a grape vine sleeping, sleeping;
Nor a word her closed lips say;
But her beauty is bright as the banners of light
That herald the coming of day—
And an infant smile on the lips the while
Plays light as a dream of May—
As if she were dreaming of May.

II.

The winds with the clusters are toying, toying,
With the clusters of purple and pearl;
And with kisses rare they stir the hair
On the brow of the radiant girl,
Till soft as a flake their kisses awake
From her dreams the infant girl.

III.

She sits 'neath the grape-vine waking, waking,
Though her red lips nothing say;
And the clustering wines o'erburden the vines
With clusters as purple as day;
And her hands milk-white clasp the red delight
Of the vintage as purple as day.

IV.

She sees not the serpent creeping, creeping;
With so slow a motion he creeps
That he stirs not the sheaves of the fallen leaves
Where the sweet anemone sleeps;
With a motion so meek it seems not to break
The sleep, the anemone sleeps.

V.

He glides 'neath the grape vine hissing, hissing;
And his tongue is right red to-day;
And the glitter and gleam of his eye hath a dream
Of wrong in its scintillant ray;
But with innocence bright she is clad like light
And she heeds not his hiss in her laughter and play.

Brooklyn, N. Y., 1870.

◆

Quarantine, Staten Island, March 21, 1870.

Gerritt Smith, *Esq., Secretary T. M. L. I. A.:*

Enclosed please find my assessment on account of the death of our brother operator, Charles D. Smith. Have noticed an article in our Journal of the 15th inst., headed "Telegrapher's Mutual Insurance," in which some suggestions of change are made, and as the views of members are invited, am glad of the opportunity of expressing myself in favor of the universal acceptance of telegraphers, without conditions or restrictions, as members of our association; and also, that each member be assessed one dollar whenever a death occurs among us, in order that the families of the deceased may receive the full benefit of the entire membership. Anything short of this would, I think, be *scarcely just, and less than kind.* The assessments are not heavy, and even if they were a strain upon our small means, who of us can be really poorer for such disbursement? If our purses are lighter for these calls, surely our hearts must be also; and what at most is but a trifle to each, in the aggregate amounts to a real, substantial blessing to the bereaved and often entirely destitute families, whose loss who can know. God bless the kind heart that dictated the warm and sympathetic words, "Yes, we would insure him, if he could not move his little finger, and was laying his worn head on the bosom of death." So say I, and so I trust will say the majority of our number.

Very respectfully,
E. Sammis.

◆

Amelioration of Wines by Electricity.

As a very tangible proof of the gain obtained by the immediate conversion of young wines into drinkable beverages by means of electricity, the author states that, considering that the annual production of the wine of France amounts to from 60 to 70 millions of hectolitres (each equal to rather more than 22 gals.) and that at least 10 francs per hectolitre is lost by vaporization during the time of the maturing of the wine while in casks, this represents a number of from 600 to 700 millions of francs gained by rendering wine fit for immediate consumption by the author's electric process.—*Dr. Scoutetten.*

Journal of the Telegraph.

Tillitson Testimonials.

"Your beautiful instruments compare favorably with the best Morse apparatus in Europe."

[S. F. B. Morse.

"Substantial in make and tasteful in design."

[W. J. Holmes, Supt.

"Superior to any we have in use."

[E. A. Calahan, Supt.

"Have given entire satisfaction, and cannot be excelled."

[W. S. Putnam, Supt.

"Toughest wire I ever handled. Instruments have given entire satisfaction."

[H. W. Stager, Supt.

"I have never seen any work surpassing yours."

[J. Desmond, Supt.

"Not a single instance of imperfection has come to my notice."

[M. L. Wood, Supt.

"Reliable in every respect."

[Chas. Peterson, Supt.

"Your work has given every satisfaction."

[W. H. Heiss, Supt.

"Workmanship and finish is all that can be desired."

[T. H. Miles, Supt.

◆

Gray & Barton write from Chicago: "We have no room to do half the work offered to us, and must move into larger quarters!"

◆

West Point, Ga., March 24, 1870.

James D. Reid, *Esq.:*

Dear Sir: I fully agree with your views in regard to assessments and membership, as per Journal of 16th inst., and glad to have every employe of the Western Union Telegraph Company included, and hope that no limit of membership will be made.

It is evident that the more members we have the more beneficial it will be to our families, and will leave them in a far better condition.

Where is there an employee of this Company that is not able to save the amount needed out of his salary? They spend at least from five to twenty-five dollars per month for the theater, concerts, &c. Cannot they deduct one dollar per month, and deprive themselves of a theater ticket, and appropriate it to this great cause, which eventually is paid back to them? Would not this cover all the assessments? Is there any record that will give the death of twelve operators in the United States in one year? Any man of common sense can certainly see the benefit derived. Would not this dollar, spent for liquor, shorten your life? On the other hand, would not this dollar, saved and given to the widow of a fellow craftsman, maintain her or assist in educating her children? This applies to each one of us alike in the end. Very few, if any, operators are without some one to support.

I sincerely hope that all employees of this Company will carefully consider the matter and the importance of insuring, and insure at once. Life is uncertain. We may be taken away at any moment, and our families left to the liberality of this pitiless world.

Although I have only been a member for a short time, I am proud to know that I am worthy of membership, and consider it an honor, and would cheerfully agree to an assessment of two dollars instead of one, as I feel that I am doing justice to my family and to my fellow-man; and that it is nothing more or less than a "deposit" to sustain them when I am no more.

Yours, truly,

A Member.

Bainbridge, Indiana, March 24, 1870.

Gerritt Smith, *Secretary Tel. Mutual Life Ins. Asso.:*

Dear Sir: An article in the Journal informs us of questions that are arising in the organization, as to the necessity of its limitation, both as to members, and the amount paid, more restriction to the insured, &c., and requests the views of members on these points.

Are we to infer that members of the organization who are raising such questions are becoming alarmed by its increase in strength and usefulness? Are they fearful that the number of assessments will be increased, and that the *total* sum of one (1) dollar from each will, in each case, be applied to the relief of some bereaved and distressed family? If not, why are these questions originated?

Assessments may come oftener, and be hard upon us who have nothing except our wages for the support of our families, but a like amount could not be invested to more profit, nor in a better cause.

I am not in favor of these proposed "limits." I believe that all of the craft who are *worthy* and elligible should have an equal right to join us, and that the entire amount of each assessment should be paid in each case, as has been provided by the articles of the Association.

Let it increase; let it double and even triple its number, and it will be all the better. Let all of the craft who are disposed to do so, come in with us—add their strength to ours, and aid us in the great and good work which such an organization is intended to accomplish.

I would be glad to see every member labor to obtain one or more new additions to the organization, so that the number might be more than doubled during the present year, and I think this might be done by a little effort.

Yours, truly,

G. W. Dyer.

CHARLES WILLIAMS, Jr.

109 Court Street,

BOSTON, MASS.,

MANUFACTURER OF

TELEGRAPH INSTRUMENTS,

BATTERIES,

AND MATERIALS OF ALL KINDS.

Wm. Kidd, C. H. Peirce,
A. Boody. C. S. Otis.

KIDD, PEIRCE & CO.,

BANKERS,

19 BROAD STREET AND 57 EXCHANGE PLACE,
NEW YORK.

Stocks, Bonds, Gold and Government Securities bought and sold on Commission.

CHAS. T. & J. N. CHESTER,

104 CENTRE STREET, N. Y.,

TELEGRAPH ENGINEERS,

And Manufacturers of

INSTRUMENTS, BATTERIES,

AND EVERY DESCRIPTION OF TELEGRAPH SUPPLIES,

Offer the best guaranty of excellence in their profession—in their long established business—in the extent and variety of their manufacturing facilities—in the many improvements introduced by them, now almost universally adopted or imitated—and in the extent of their business, domestic and foreign, enabling them to keep pace with telegraphic progress.

They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer.

McKEE'S RAILROAD SIGNAL BOX.

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VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

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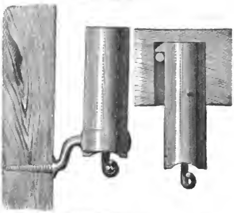

The guarantees of this insulator are:

1st. A current resistance in rain or fog, or in rain and combined of 100,000,000,000 Ohmads.

2d. To insulate a conducting wire of any length in rain or fog or rain and fog combined, to its full working capacity, or the capacity of a similar wire or conductor placed upon any other insulators under the most favorable circumstances of weather.

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It is not injured by missiles in the general acceptance of the term.

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John Polhemus, Printer and Stationer, 102 Nassau Street, N.

JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 11. NEW YORK, MAY 2, 1870. WHOLF NO. 60.

A Code for Office Messages.

The adoption and general use of a well arranged number code for office messages would, undoubtedly, be of great service, with the advantages of greater accuracy and an economy of time. Numbers were used for this purpose to a limited extent years ago, but their efficiency was greatly contracted by the existence of numerous distinct and independent companies. The promulgation now of an office message code by the Western Union Company would insure universal adoption and observance throughout the United States.

How much easier to write "33 Smith-Jones, 14 Wall street," than "Smith not at 14 Wall street; yours signed Jones, give better address:" or, "35 Comstock-Plum," than "Please repeat carefully to my care yours to Comstock signed Plum. Not understood. Thinks an error in it."

Not unfrequently it becomes necessary to send an office message with the checked message to which it refers. Such, for instance, as the following: "Get answer quickly; person leaves town soon." "No answer desired unless prepaid." "Answer of ten words paid for here." "If not found drop copy of telegram in post-office." "Deliver by special messenger if necessary. Expense paid here. Report charges." We will suppose the last office message to be represented by 37, it would be expressed in the check of the original message thus: 10 w paid ofs 37."

Again, the sender of a telegram is very anxious to know that his message has gone through and been received by the person addressed, without particularly desiring a reply. He wants an acknowledgement of receipt of his message and is willing to pay for the information. Now, suppose we charge him half the tariff for ten words and give him the information he desires. The messenger that delivers the telegram has pasted in his book a printed list of replies with the numbers that represent them. Among the list would be the following:

"Delivered at office. Not in but expected soon."

"Delivered to family at residence. Out of town but expected in few days."

"Delivered personally. Will reply by night message."

"Out of town. Not known when will return."

Large offices might have printed forms of such replies to send out. Small offices could write them.

Fred. S. Heath, Norfolk, sends a telegram to H. C. Lockwood, Cuyahoga Falls, and has paid for acknowledgement of receipt. The last office message in above list expresses the reply, and may be represented by 42. The messenger places that number on his book opposite Lockwood's name, and the clerk's officè message to Norfolk reads:

"Lockwood-Heath, 42," using even numbers for this class of office messages, and odd numbers for the others. HOLLOWAY.

A Trying and Unpleasant Position of A Telegrapher.

MOBILE, Ala., March 25, 1870.

Editor Journal of the Telegraph.

SIR: Some time during the early portion of the war, the writer of this was in charge of the telegraph office at Lynchburg, Va., and the following incident took place:

There was to have been an execution at Knoxville, Tenn., of a person who had been tried and convicted (by a military tribunal) of bridge burning. The execution was to have taken place at 2 o'clock P. M.

The daughter of the condemned man telegraphed at an early hour in the morning to President Davis, at Richmond, Va., begging of him a pardon for her only support, her fathėr. This message was received by me from Mr. D. E. Norris (now the Manager of the Western Union Telegraph Office at Macon, Ga.) at about nine or half-past nine o'clock A. M. I at once forwarded it to Richmond, and awaited with some degree of anxiety for the President's reply, hoping that the prayers of the petitioner might be granted. At about twelve o'clock Rd. called Bg., saying, "Here it is; read it through." I copied it and went over to the Western instrument to call Kd.; I called once or twice, and I believe Kd. answered me, but before I could tell him what good news I had for that poor woman, or before I could send the message, some one of the numerous little offices between Lynchburg, Va., and Knoxville, Tenn., put on their ground wire and most effectually cut me off. Here comes the trying time. Here I was with the pardon of a human life in my hands, and was unable to forward it to its proper destination, owing to that horrible practice some operators have of resorting to their ground wire to enable them to get possession of the line. This practice is still in vogue, I believe, over that same line, though if the operators on that portion of the line had been placed in the unfortunate and trying position that I was in, they would never resort to it. You must recollect that the execution was to have taken place at two o'clock. The operator at Dublin Depot, Va., was the person who obtained possession of the line on that occasion. He cut me off at 12 o'clock, and did not remove his ground wire until fifteen or twenty minutes of two o'clock, the fatal hour!

I at once called Knoxville, and a good fortune smiled upon me. He answered. The pardoning message was sent, and though at first the operator at Knoxville said he was afraid it was too late, as the officers of the law, with the culprit, had left the jail some time before the receipt of the telegram, for the place of execution. I am happy to say he or his messenger were just in the nick of time to save the life of the condemned. S.

WESTBROOK VS. MORSE.

The Automatic Indented Paper Process.

Mr. C. Westbrook, instrument maker of Harrisburg, Pa., has made a publication of an invention he claims as his own, but to which, without attaching any special importance to it, we have questioned his right. This, of course, has not been agreeable to Mr. Westbrook, and he has not withheld a very free if not very polite expression of it. We have not been disturbed by this further than a sincere feeling of regret at being obliged to disabuse his mind of the originality of his claim, while, at the same time we were careful to say that he may have really invented the process without knowing or suspecting that it had been discovered by another long before. The same thing occurred in 1868 with so eminent a man as Sir William Thompson, of Glasgow, who exhibited to the Royal Society of London and claimed as his own a process which had been previously and exhaustively worked out and patented by Mr. C. F. Varley. Sir William acknowledged the priority as soon as it was made known to him and at once accredited his friend. Mr. Westbrook does not seem equally willing to disrobe himself, so we give the simple facts as completely as even Mr. Westbrook can desire them, not to injure him, or give any special merit to a system not likely to be immediately adopted, but to supply a link in telegraphic development and give the credit to whom it properly belongs.

To arrive at the facts connected with this matter, we addressed the following note to Prof. Morse. We were prompted to do this by the publication of a letter from Mr. Westbrook, in which he asserts his claim in connection with references to Mr. Morse, which we deemed unjust and uncalled for.

NEW YORK, March 3d, 1870.

Prof. S. F. B. MORSE.

DEAR SIR:—Mr. C. Westbrook of Harrisburgh, Pa., whom I have long known and regarded as a man of strict integrity, claims the invention of the use of the indented paper of the Morse Register for rapid automatic transmission. I have, on what seemed to me sufficient data, denied the correctness of the claim. Will you enlighten me on this subject, as, if I am wrong, I shall at once acknowledge it.

Yours very respectfully,

J. D. REID.

PROF. MORSE'S REPLY.

NEW YORK, March 8, 1870.

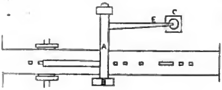
DEAR SIR:—In your note to me of the 3d instant, you apprise me that Mr. C. Westbrook lays claim to the invention *of the use of the indented or embossed paper of the Morse Register for rapid automatic transmission*, and this claim you say you denied him on what seemed to you "*sufficient data to support the denial.*" Your request for "enlightenment on the subject" I cheerfully comply with, since it will, I think, fully sustain you in your position.

I have also been shown a letter of Mr. Westbrook, recently published, in which he makes the same claim, and I regret that in making it, he should have thought it necessary to use language which can only be interpreted into a charge against me of surreptitiously appropriating an invention belonging to him. I have no choice, therefore, but to give facts and dates, which will enable your readers to judge of the merits of the case.

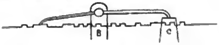
I learn from Mr. Westbrook's letter that he "exhibited his instrument and process to you and others *in the Spring or Summer of* 1868." That is, about *two years* ago. This date, therefore, appears to be the date of his invention. That there need be no doubt of the nature of this invention, Mr. Westbrook quotes from my Report to Government on the Paris Exposition of 1867 my description of my own process of *using the embossed strip of the Morse Register*, he intimating that in this description I was "*describing*" and "*indorsing*" his system. This is conclusive as to the identity of the two systems. If, then, they are alike, and two persons claim the invention, the question of *priority* is determined by the dates respectively of the two inventions. The ground of your denial of Mr. Westbrook's claim was my statement to you that I had suggested and drawn out the same plan in a letter to Mr. Alfred Vail more than *twenty years ago*. I have procured a copy of this letter, which you will perceive is of the date of May 8th, 1848. It is as follows:

POUGHKEEPSIE, May 8th, 1848.

DEAR VAIL:—Since writing you last I have been thinking of a mode of *breaking and closing circuit* with as great rapidity as Bain can, and using the paper we now use, with no other change than having the paper a trifle thicker and strongly sized and used damp, so that on drying, which may be done instantly after it is indented, the indentations will be hard. Prepare the indentations then by striking our key, as now in our manipulations. Take the paper thus prepared and hard and let it pass with the raised side of the paper uppermost under a delicate lever formed substantially as in the diagram below.



A is a thin, broad strip of wood, metal or any other convenient substance attached to the metal shaft a, as an arm or lever, and its edge resting on the paper so as easily to be raised by the raised part of the paper. B is a metal arm say of platinum, connected also with shaft a.



C is the metal anvil on which the arm B strikes when A is raised and makes connection with the battery of the circuit. You will comprehend the action, and if the parts are well made, it will be as good a mode of making and breaking circuit as Bain's, and will possess the advantage over his that the paper can be prepared with the same rapidity that we now write, that is, double the rapidity with which he now prepares his paper.

Show this to Mr. Kendall, Mr. French, Drs. Page and Gale, and let them certify to the time of seeing it.

In great haste, but truly as ever, yours,

S. F. B. MORSE.

TO ALFRED VAIL, Esq.

Seen by me May 9th, 1848, at 12 o'clock M.

CHARLES W. MORSE.

The enclosed letter on the other side of the sheet I have seen this day, and understand the plan explained. ALFRED VAIL.

WASHINGTON, May 11th, 1848.

The original letter is preserved by Mr. Vail's widow in a bound book of Mr. Vail's correspondence.

Mr. Westbrook says that neither "he" (Prof. Morse) "nor no one else has asserted or claimed that the Morse embossed strip was ever used as a means of automatic transmission until I," (Mr. Westbrook) accomplished it." Mr. Westbrook professes to have accomplished it "*in the Spring or Summer of* 1868." But this letter to Mr. Vail shows that the plan was conceived and embodied in drawings *twenty* years before. Nor was this invention "buried in the Catskill Mountains by way of giving it age," as he facetiously remarks. In 1864 Mr. Bain sold to the American Telegraph Company his machine for punching the strip of paper. Some time previous to this date he exhibited his machine, a beautiful and effective instrument. I witnessed its action, and then proposed that the Company should use my mode of employing embossed strip, which I had devised in 1848. But Mr. Westbrook quotes my description of this process from my Report of the Paris Exposition of 1867, claiming it to be a perfect description of his mode. It may be well, therefore, to note that this Report was read before the Board of Commissioners in Paris, and approved by the Board previous to June 29th, 1867, or about *one year* before Mr. Westbrook brought forth the same mode. In November, 1867, being in Dresden, and finding the subject of automatic transmission engaging the attention of telegraphic officials, I embodied my plan of 1848 (as described in my Report of 1867) in an instrument, and showed it in operation, adding the "ink-roller" described on page 96 of the Report. This was some *six months* before Mr. Westbrook professes to have brought forth his invention. These facts and dates, which can be fully substantiated, if necessary, I believe are sufficient to decide the question of priority.

Respectfully, your ob't servant,

SAML. F. B. MORSE.

NOTE FROM THE COUNSEL AND SECRETARY OF THE AMERICAN TELEGRAPH COMPANY.

44 WEST 22D ST., NEW YORK.
March 9, 1870.

MY DEAR PROF. MORSE:—I distinctly remember that at the time when the American Telegraph Company were negotiating for the purchase of a paper punching machine, to be used in telegraphy—I think it must have been the invention made by Bain—you told me (confidentially, as I understood) that you had many years before invented a mode of transmitting telegraphically by using embossed paper.

You explained clearly what your plan was—so that I could order a machine to work with the embossed paper. But my memory is not very distinct as to your offer of the invention to the Company to use it, although I have an indistinct recollection that you said, "There it is, and you can use it," or something to that effect. Yours truly,

CAMBRIDGE LIVINGSTON.

POUGHKEEPSIE, March 10th, 1870.

I well remember that Prof. Morse and family passed the Winter of 1867-1868 in Dresden, for I was with them as tutor to their sons. One day he invited me to his room and showed me a little instrument which he had constructed for the purpose of using his "embossed paper" for automatic transmission of dispatches, and, connected with it, a mode of inking the embossed projections. I well remember it accomplished the purpose perfectly. He told me then, that for many years he had often suggested this plan to various persons, and expressed his surprise that the mechanicians who were intent on modes of automatic transmission, had never thought of using the embossed paper for that purpose, as it appeared to be the simplest mode of preparing the paper for such transmission.

JOHN R. LESLIE

◆

The Power of Attention.

In proportion to a man's power of attention will be the success with which his labor is rewarded. All commencement is difficult, and this is more especially true of intellectual effort. When we turn for the first time our view upon any given object, a hundred other things still retain possession of our thoughts. Our imagination and our memory, to which we must resort for materials with which to illustrate and enliven our new study, accord us their aid unwillingly, indeed, only by compulsion. But if we are vigorous enough to pursue our course in spite of obstacles, every step as we advance will be found easier, the mind becomes more animated and energetic, the distractions gradually diminish, the attention is more exclusively concentrated upon its object, the kindred ideas flow with greater freedom and abundance, and afford an easier selection of what is suitable for illustration.

And so the difference between an ordinary mind and the mind of Newton consists principally in this, that the one is capable of a more continuous attention than the other—that a Newton is able, without fatigue, to connect inference with inference in one long series toward a determinate end: while the man of inferior capacity is soon obliged to break or let fall the thread which he has begun to spin. This is, in fact, what Sir Isaac, with equal modesty and shrewdness, himself admitted. To one who complimented him on his genius, he replied that if he had made any discoveries it was owing more to patient attention than to any other talent. Like Newton, Descartes also arrogated nothing to the force of his intellect; what he had accomplished more than other men, he attributed to the superiority of his method. Nay, genius itself has been analyzed by the shrewdest observers into a higher capacity of attention. "Genius," says Helvetius, "is nothing but a continued attention." "Genius," says Buffin, "is only a protracted patience." "In the exact sciences, at least," says Cuvier, "it is the patience of a sound intellect, when invincible, which truly constitutes genius." And Chesterfield has also observed that "the power of applying our attention, steady and undissipated, to a single object, is the sure mark of a superior genius."
—*Sir William Hamilton.*

THE BRITISH TELEGRAPHS.

"Trouble, Trouble, Toil and Bubble."

From the London Daily News.

The change of weather which the Marquis of Hartington told us would put the telegraphs in order has not brought the expected improvements with it. The frost has utterly vanished, the "atmospheric disturbances" due to sharp east winds have ceased, but the winter of our discontent, so far from having been made glorious Summer, is scarcely broken by the first promise of Spring. It is now over three weeks since the telegraphs passed into the hands of the post-office officials, and they have not yet succeeded in getting the system into working order. The Postmaster-General is hopeful, Mr. Scudamore is apologetic and confident, but the public, who are suffering immense inconvenience while the officials are learning the business, are tired of apologies and will soon begin to scold. No doubt something has been done. The Liverpool Chamber of Commerce are assured that "a new wire has been ordered for Liverpool;" and commercial and municipal bodies all over the country are told that every effort is being made to overcome difficulties. The provincial newspapers are no longer compelled to appear with their Parliamentary reports cut short in the middle, and complaints are no longer frequent of the arrival of telegrams later than letters which had been posted after the dispatch of the message. Complaints of an entire breakdown are, however, not altogether at an end. The Belfast newspapers of Monday had received no telegraphic dispatches from one o'clock on Saturday afternoon till one on Monday morning, and then only a meagre sheet or two had come in when they went to press. The ordinary complaints are, however, not so much of the stoppage of communications as of inefficiency and delay. There is no certainty about the telegraph. It may take your message as correctly and as quickly as of old; but there are about equal chances that it will either blunder or delay it. Nor is this inefficiency confined to any particular district. It is as great in the Metropolis as elsewhere. It affects the London papers as much as it does the papers published in any other part of the country. Everywhere telegraphic intelligence is scanty, and what there is comes in a bad form. A great system of internal communication has been smitten with palsy, and communication has become halting and fitful. Our modern Mercury is slow of speech, and his winged heels are feeble. The post-office officials do not seem to have comprehended the task they undertook in taking charge of the telegraphs. They seem to have no notion of the absolute necessity of exactitude and dispatch. They go about it with the leisurely movement of Government officials, instead of doing it with the speed and precision of men of business; and there are already indications that ere long the public may begin to think that the very worst day's work ever done of late years was that of taking the telegraphs from the hands of responsible and competing companies, and making them a monopoly in the hands of an irresponsible Government department.

We are, however, still hopeful that this inauspicious beginning will be made up to us at length. Mr. Scudamore is too able and efficient an officer to allow the department under his control to degenerate into inefficiency. But our fear is, that the officials have fallen into the trap against which we ventured to warn them at first. The temptation of the post-office is revenue, and the working of the telegraphs has been rendered inefficient by a too great desire to make the first balance-sheet a good one. Offices have been concentrated; the same number of clerks has been made to cover a wider extent of country and to work a larger business, and general flurry is the result. It is quite probable that, to all outward appearance, this economy would be justified on a mere comparison of the aggregate amount of work with the number of hands employed to do it. But telegraphic work is a different thing from the dispatch of letters. It must combine quickness with correctness, or it is useless. It must not merely be cleared off, but must be promptly dispatched. Yet it seems to us that the post-office officials have provided merely for clearing it off. There are so many dispatches passing through a certain office in so many hours, and enough clerks have been retained to send them within the time. What is wanted, however, is that every office shall be sufficiently well served to bear pressure. A glut of messages ought to be impossible. It would be all very well in an ordinary business to equalize work by using vacant moments in clearing off the arrears of busy hours, but in the telegraphing business such an arrangement means inefficiency and disappointment. This failure to appreciate the urgency of their new business, extends, we fear, all through the department. The clerks in the offices are beginning to put on the leisurely airs of Government servants. If this is to be the temper of the new administration, there is no reason to wonder at delays. With leisurely officials, and those officials too few, and with a cheaper tariff, and consequently more work to do, we have all the elements of an inefficient administration; nor is there any hope of better things till efficiency has been put first and revenue second in the thoughts of the heads of the Department, and underlings have everywhere been impressed with the supreme importance of promptitude and efficiency.

There are one or two modifications against which we have already protested, made by the post-office in the working of the machinery, which have removed the checks we formerly possessed against delay. The telegraph companies found by experience that the best way to insure the prompt dispatch and delivery of messages was to note the time at which they were received and sent off at each end. The telegraph boys brought with them to the recipient of a telegram a form to fill up stating the time at which he received it. On the message itself was the time it had been received at the office, and the time the boy was sent out of the office with it. Every message consequently checked itself, and any delay in its delivery could be traced at once. The post-office officials abolished this safeguard at a stroke. With the usual official conceit, they threw over a form which had grown out of long experience and improvised a new one. The telegrams now give us no means of checking any part of their course. They are dated just as letters are, with merely the day of the month stamped on them, as it is stamped on a letter. The precautions taken for threepence in the case of a registered letter are all abolished on shilling telegrams. The post-office is too much in a hurry to do anything even to save time. The result is not only waste of time, but an utter impossibility of fixing the responsibility of such waste. A merchant advises his agent to purchase at a certain price; the purchase is not made, and the agent tells him he did not get the telegram in time. A broker in Manchester telegraphs to his broker in London to sell out or buy on a certain afternoon. The broker has reasons for neglecting it, or for some reason the transaction is not accomplished, and the fault is laid on the telegraph. A newspaper engages a reporter to attend some event of interest which is happening at a distance, and to telegraph an account a column long. The case is over early in the afternoon, but the telegram comes in at four o'clock in the morning, when any paper of large circulation must have been some time in the press. In all these cases the telegram is paid for, but it is useless, and there are no means of recovery against the post-office as there were against the companies, and none of ascertaining at once where the fault lies. Under the old system it would be clear at once where the delay originated. If the sender was late, or the deliverer of the message lingered on the way—if it was kept at the dispatching office or delayed at the office which received it, the fact appeared at once. The present system gives no such check, and consequently no such security. It has taken away from all the officials, from the telegraph clerks at each end, and even from the telegraph boys, that perpetual reminder of the need of dispatch which the noting of the time provided. By introducing the letter stamp in place of the entry of the time, it has even taught them that the only thing of importance is the day, and that the hour and minute are not to be attended to. This check must be restored if the telegraphs are ever to work again as they did of old. We cannot now go to another company if the post-office displeases us; all we can do is to urge the officials to do better, and to appeal to Parliament if they refuse. The country cannot afford to have its telegraphic business badly done. It has given the post-office the work in the confidence that it would do it well; but the post-office has not yet done anything to justify the change; and if the Postmaster-General and Mr. Scudamore do not succeed in effecting great and speedy reforms in the system, the public will regret that the business was ever transferred to their hands.

Government and the Telegraph.

Experience is so overwhelming to establish the conclusion that what individuals can do at all they can do a thousand times better than Government, that we should just despair of convincing any adult who needs conviction on this point. But as an illustration we copy from an English newspaper the following important business dispatch sent from Edinburgh to London, delivered at its destination in the following words:

"Case answer take that cannot points up ilferent come in must of on B. beg a to-morrow last stated sum send letter at was us ground once accepted definite we C. for instructions are letters furniture to to bear."

And with this warning example before us, we are asked to hand over our telegraphic system into the hands of Government in imitation of the folly of the English. Why not go back at once to monarchical institutions with an hereditary house of peers, or better still, go down on our knees like penitent children to Queen Victoria and ask her to be taken back as obedient colonists, promising never to be naughty—no, never no more!

While we would be the last to reject a good measure because it was English, we need some stronger reason than British example to induce us to surrender the American principle of self-reliance, for the unavoidable corruption and inefficiency of a paternal Government.—*The N. Y. Exchange.*

Magnetic Storms.

St. Joseph, Mo., March 16, 1870.

R. C. Cloway, *Esq., Superintendent.*

Dear Sir: You requested me to write the particulars about the "magnetic storm."

I hardly think I can do full justice to the subject, but will describe its effects on the wires and on the instruments of my office, as near as I can.

The first indication of any change in the circuit, on Nos. 1 and 2 north (Omaha lines, 140 miles), was on Monday, the 14th instant, about 4 or 4:30 P. M., when we noticed a sudden strengthening of circuit on No. 1; it got so strong that we had to open the key, and soon after the line commenced to discharge the surplus electricity through the open key, at intervals of about one discharge per second—the discharge being somewhat similar to that of lightning, causing a pretty loud report. After escaping through the open key a few minutes, the repeating sounder on the opposite table (to which the wires of this No. 1 line are attached) became so highly charged that a bright bluish blaze, nearly the size of the magnet ends, formed under the armature, causing a hissing sound to issue therefrom. The effect on No. 2 wire (being the upper one on the poles) was not near so strong, yet strong enough to prevent any operating thereon. It continued in this way without much change until this forenoon, when it gradually decreased in strength, leaving the wires entirely about noon. I noticed that by connecting No. 1 wire with the ground for a short time that a large part of the charge would be carried off, leaving the circuit much weaker, but in a few seconds the wire would be surcharged again.

During all this time a strong gale was blowing, accompanied part of the time with light snow. The wind was from the West—N. W. and N.—mostly from W. and N.W.; weather cold, raw. On the lines East and South we felt no trouble.

Very respectfully,

Wm. H. Woodring, Manager.

Thermo-Electricity.

J. Delaurier says: "I have proved the existence of metals and other bodies which are by themselves thermo-electric, and these I call active bodies. The production of electricity is not due to the two metals which are soldered or joined together, since a non-active metal is only a carrier.

THE TELEGRAPH IN EUROPE.

Female Employment

Female employment by telegraphic companies may be classed in four different categories.

In the first the service is entirely performed by men.

In the second the woman is only an auxiliary, admitted as a member of the employe's family, and working under his responsibility.

In the third, she may take charge of an office, but her services are limited to secondary stations.

In the fourth she participates in the forwarding of any dispatches in all offices.

1st. In the first of these categories are comprised the European Administrations of Austria, Spain, the Papal States, Greece, the Netherlands, Portugal, Romania, Servia, Turkey, the India-European and the Anglo-Mediterranean Companies, the services are made exclusively by men.

2d. In the second category we will place Bavaria, Belgium, and Northern Germany. In the two first the co-operation of women is excessively limited. It is not admitted in any telegraph office, strictly, so called; but only in those offices where the postal service is combined with the telegraph, when the manager may receive especial authorization to employ a member of his own family, without distinction of sex, and he may then have recourse to female service as an auxiliary for telegraphic purposes.

In Northern Germany female co-operation is somewhat more extended, inasmuch that she is not restricted to offices where the service is but secondary, but she is admitted in offices exclusively telegraphic. Employes of the Telegraph Administration of Northern Germany are chiefly found among old soldiers; nevertheless, since the 1st of January, 1869, in those offices where the daily work does not require the constant co-operation of a second male employe, the Administration has authorized the manager in order to render the service *more effectual* to employ an adult member of his own family, either his wife or daughter; but the manager is the only recognized *clerk*; he instructs the assistant whom he engages, but he alone is responsible for their work, the Administration only interfering to give the necessary authority.

For remuneration for the labor of these assistants, the manager of the office receives an indemnity of six thalers ($4.50) for a monthly transmission of 840 dispatches. The monthly remuneration is increased to two thalers ($1.52) for every supplementary increase of 120 dispatches. However, this measure having so recently gone into force, such offices are not yet very numerous. Still, they are increasing every day.

The Administration of Northern Germany, in acknowledging the satisfactory results of this combination of service, find in it the advantage of having to pay only an annual allowance of from 70 to 80 thalers, whereas the salary of a second male clerk would occasion an annual outlay of at least 300 thalers; the difference constitutes a saving of from 800 to 900 thalers per annum.

3d. Three Administrations, Italy, Hungary, and France admit women as employes, and give them a large part of the work. We place the Italian Administration in the third category, because its organization permits in PRINCIPLE the employment of women on similar conditions, but in effect—until the present time—their co-operation has been almost ignored.

In Italy the personnel charged with the work of transmission comprises three branches of employment: The officers, the clerks, and the provisional employes. The latter are *not* in effect clerks of the Administration; they are irregular auxiliaries, who, whilst they contrive to attend to their usual avocations, undertake the service of secondary officers and receive 60 centimes or twelve cents for each transmission of dispatch. The terms of admission of these auxiliaries are as follows: They must be Italians or naturalized. They must have a certificate of good character, and must pass an examination on the primary knowledge of Arithmetic, Geography, Theoretical and Practical Telegraphy. The persons who are candidates for such positions are authorized to initiate themselves to the work in an office of the Administration before being examined, and it is only among these auxiliaries that *women* can be admitted.

The Italian Administration acknowledge that the system of these assistants has given good results, but declare nevertheless that the service has remained in reality in the monopoly of men. Only one woman has been employed in the same capacity as the male clerk or operator, and notwithstanding her work has been satisfactory in all respects, she has since abandoned her position for private reasons. In Hungary the participation of women is more complete. On the one hand they are employed as assistants first under the responsibility of the manager, and secondly, on their own account. On the other hand, they have been charged directly with the management of secondary offices. In the first instance, as in the management of the Administration of Northern Germany, these assistants are chosen from the employe's or manager's family, and accepted after having passed an examination more practical than theoretical, upon the working of the machines and the knowledge of the rules. But, contrary to the rules of Northern Germany, if the correspondence or transmission becomes considerable enough to necessitate the help of two employes, they keep for their own account and under their own responsibility, the position of second employe. They then receive an annual income of 300 florins or $168. Besides this co-operation which they bring as members of the manager's family, women will also be admitted to manage secondary offices, the correspondence of which is limited, and which the Hungarian Administration trusts to private persons under conditions regulated by contract. Like those who are attached as *clerks* to the offices managed by employes, outside agents are obliged, after taking the necessary steps for their instruction, to pass the above mentioned examination. The Hungarian Administration has as yet but very few pupils of this category, so that it is not able to speak decidedly of the results which this system will produce.

In the French Administration the path for women is almost the same as the Hungarian, but as *their* participation has been admitted since 1863, an experience of several years allows a more complete appreciation of the measure. In the offices of full day services where the woman is called upon to assist her husband or father, the *latter* receives for her service and for which he remains responsible, a supplementary annual allowance of 300 francs. The number of such offices has never been very large, and seems to decrease, for this combination is gradually abandoned in most stations where it had operated until the present time, on account of the increase of the business.

[*To be continued.*]

THE ELECTRIC FARO BOX.

The Greatest Gambling Invention of the Age.

One of the most ingenious inventions for fraud and deceit ever introduced to the "sporting fraternity" has recently been placed on private exhibition for the inspection of a few select gamblers. It consists of an electric faro box so constructed as to permit cards to be secretly drawn, at the will of the dealer, without the possibility of the manner in which the movement is made being detected. It will be necessary first to say to those who have never fought the tiger that a faro box is a very simple affair, usually made of some kind of metal, and is used to hold the cards which are presumed to be drawn singly while the game is being played, until the whole pack is exhausted. Every second card shown, except the first card, which is called the "soda," wins throughout the game. The first card shown loses.

This is the rule, although there are a few technical exceptions. The box is usually about four inches by three in size, and is fitted with springs which press the cards to the top, whence they are released by being pressed through a slot. In all square games but one card is passed through the slot at a time, although there are accommodation boxes which permit of all being drawn.

The electric faro box is very similar in construction to the box now in ordinary use among gamblers, except that it is invariably made of steel or iron, and the springs for pressing the cards up are spiral instead of elliptic. Through one of these springs runs a wire which controls the magnet in the box. The table upon which the box rests is fitted in the usual plain way with the lay-out the check-rack, and cases. Upon the lay-out, however, depends very much of the success of the fraud. This unpretending article is usually only a board covered with cloth, upon which is fastened one of each of the several denominations of cards in a full pack. These cards when used in connection with the electric faro box are oxodized and placed upon the cloth in such a way as to completely dispel all suspicion of their character. This is a part of the secret of the invention, and is claimed to be an entirely new thing in the science of electricity. Attached to these cards, and running from each separately, are fine copper wires, which are placed under the lay-out board and run down through one of the table legs, where they connect with a battery under the floor.

The cards used may be of the common kind, but before being placed in the box they are immersed in a powerful magnetic solution, which is also held as a secret. When the game is about to open, and the dealer takes his seat, the table has the appearance of a very ordinary piece of gambling furniture. The box is produced and placed upon the table, immediately over a strip of oxodized cloth, highly charged with electricity, and the game begins. All the cards being magnetized, both in and out of the box, the current of electricity is made complete by a magnet skillfully adjusted in the box, which is always under the control of the dealer. As all money at a faro bank is usually represented by chips, some weight is placed upon a card when a bet of any importance is made—for ten or a dozen chips will weigh several ounces. So sensitive are the cards on the lay-out that the slightest pressure is at once telegraphed to the representative cards in the box, and in consequence of their becoming magnetized they cannot be made to win unless the dealer breaks the current of electricity.

This is done by an ingenious contrivance which detaches the magnet in the box, when the current is off. Otherwise the cards, having been prepared for the purpose, would come out in pairs or double, very much after the fashion of braces used in all skin games. This is not easy of explanation, except that every card on the lay-out corresponds with four similar cards in the pack, and that they are severally magnetized, so that any card upon which a bet is made must lose if permitted to come out double with another card. This is done through the slot, which is so arranged that a slight piece of steel can be moved so as to increase or diminish the aperture. In this manner the deal can be changed—a proceeding that all gamblers will readily understand.

THE STORY OF A QUAKER MURDERER.

An Incident of the Early Days of Telegraphy in England.

The various lines of telegraph in England have lately passed into the hands of the Government by purchase, and a curious collection of telegraph machines, new and old, has been brought together at the General Post Office in London.

One of those exhibited is said to be the identical one which, just a quarter of a century ago, assisted in no small degree in bringing to the gallows the perpetrator of a most cold-blooded and atrocious murder—one Tawell, a quaker.

This is a five-needle instrument, of Cook & Wheatstone's, and from the letters of the alphabet, which are displayed upon its strange-looking diamond-shaped dial, the letter "Q" is omitted. This deficiency placed a trifling orthographical difficulty in the way of a clerk who had to telegraph instructions for the arrest of Tawell, "a Quaker," and occasioned great embarrassment to the person who had to receive the message. "Kwa" was slowly spelled, but as he knew of no word in the English language which commenced in that fashion he imagined there must be some fault in the working of the telegraph, and called upon his colleague at the other end of the wire to "repeat." The same process was renewed several times, and always with the same result, always K-w-a, until a sharp boy suggested that the sender should be allowed to complete the word.

His advice was followed, and after the receipt of three more letters the word "K-w-a-k-e-r" was formed, and at once, when read phonetically, recognized as the equivalent for "Quaker."

The part played by the telegraph on this occasion excited extraordinary interest in England, inasmuch as it was almost the first time that it had been employed there in the detection of a notable crime.

The circumstances of the case were these: About two miles from Slough, a station twenty miles from London, on the Great Western Railway, and the same distance from Windsor Castle, is a hamlet called Salthill, which was famous in the days of Eton Montem as a grand rendezvous. Eton Montem was a curious old custom long prevalent at Eton College, and observed triennially on Whit-Tuesday. It was at last abolished in consequence of the fun becoming rather too fast and furious among the scholars. The last celebration took place in 1844. It consisted of a procession of the boys in a kind of military order to the Montem, a small mount at Salthill, where they levied contributions or "salt" from the passers by and spectators. The sum collected sometimes exceeded $5,000; the surplus, after deducting certain expenses, becoming the property of the captain of the school.

The village of Salthill consists merely of a few cottages, two or three mansions, and a roomy, old fashioned inn, of a type and pattern now rapidly becoming rare. Formerly no less than seventy coaches changed horses there every day, and it was one of the busiest places on the Bath road. Close beside it stood a row of humble tenements, probably built for the accommodation of servants of the inn. One of these was destined to become the scene of a tragedy which was to all England a nine days' wonder.

On the 1st of January, 1845, a man who always wore the garb of a Quaker, and was in the habit of frequenting the Jerusalem Coffee House, a famous place of refreshment in the City of London, told the waiter there that he was going to dine at the west end of the town, and left with him a great-coat, which he said he would call for on his return.

He then proceeded to the terminus of the Great Western Railway—which was then the extreme west end—and proceeded by the 4 o'clock train to Slough.

He went thence to one of the cottages, before described, at Salthill, occupied by a woman known by the name of Sarah Hart. The cottage consisted of two very small rooms on the ground floor. Shortly after his arrival this woman went out by his directions and procured a bottle of porter, with which she returned to the cottage. Before long the next door neighbor heard a noise in Hart's house, followed by a moan and what sounded like stifled screams. Becoming alarmed, she took a light and went down the path from the cottage to the high road, but before she reached the gate she saw a man approaching that which terminated a similar path from Sarah Hart's cottage. He trembled and appeared agitated, and had much difficulty in opening the gate. The woman inquired:

"What is the matter with my neighbor? I am afraid that she is ill."

The man made no reply, but passed on his way to Slough.

The neighbor then entered Hart's house. On a small table she found a bottle of porter and two tumblers. One contained some froth, the other porter, or porter and water. The woman Hart lay dead upon the floor, with her hair and clothes in wild disorder.

Meanwhile Tawell, after a somewhat circuitous course, at last found himself again at the Slough station, where he took his seat for London.

Those familiar with the level ground between Slough and London know how smoothly the broad gauge carriages of the Great Western Railway glide over that twenty miles. The murderer, as he sank into the seat of a comfortable first-class carriage, no doubt felt that each mile diminished the chance of detection.

At that time the electric telegraph was a novelty, and very little used; indeed, on the Great Western line, Slough was then its terminus. Consequently, Tawell was probably quite unsuspicious that, as he sped over the ground, an exact description of him was on its way to London. The suspicions of an intelligent clergyman, who became cognizant of the horrible occurrence shortly after it happened, were awakened; he immediately took action in the matter, and the result of his operations was a telegram to the metropolitan police.

Long before the arrival of the train in London a policeman was on the platform, and so soon as Tawell got out of the carriage, he quickly identified him as the man described by wire, and, drawing a plain coat over his uniform, accompanied the omnibus which Tawell entered, to the Bank of England.

Tawell got out of the omnibus at the Bank, and went to the Jerusalem Coffee House, where he called for the coat which he had left in charge of the waiter. He then proceeded, still followed by the policeman, to various other places, and finally entered a lodging house kept by a member of the Society of Friends. Outside this house the policeman waited for an hour, and, finding that the prisoner did not come out, he went away. The next morning further intelligence was received from Slough, and the officer returned to the house where he left the man. On learning that Tawell had gone out, the policeman proceeded to the Jerusalem Coffee House, where he found him, and said, "I believe you were down at Slough yesterday." Tawell replied that he had not been there, and knew no one in the place. "You must be mistaken," said he, "in the identity; my station in life places me above suspicion." The officer, however, was of a different opinion, took him down to Salthill, and placed him in the custody of the local police.

The stomach of the deceased woman was chemically examined, and fifty grains of prussic acid was discovered. Subsequently the shopman was found who, on the day of the murder, had sold him the prussic acid.

In the following March the case came on for trial before Mr. Baron Parke, a judge of the first eminence, afterwards Lord Wensleydale. Mr. Serjeant, now Judge Byles, was counsel for the prosecution; Mr. Fitzroy, now Chief Baron, Kelly, for the prisoner, the latter being considered almost unrivaled as a defender in such cases.

On the 28th of the same month Tawell was executed.

The chaplain and governor of the jail sat up with him the night before the execution. He listened to the exhortation of the former, and appeared to pray with devotion.

On being reminded of a promise to leave some written statement behind, he sat down and wrote an account, which proved to be an avowal of his guilt, and of a previous unsuccessful attempt.

The main motive for the crime seemed to be the apprehension of his connection with Hart becoming known to his wife, and much of his anxiety, to the last, to conceal his guilt arose from an undeviating desire to retain the lady's faith in his integrity.

A circumstance which added considerably to the extraordinary interest felt in the case was the statement that Tawell was a Quaker—a Quaker murderer being even a greater rarity than a Quaker baby, which Sydney Smith declared he had never seen, and of which he professed to doubt the existence.

Tawell had unquestionably been born and bred a member of the Society of Friends, but having been convicted of the possession of a forged Bank of England note, was sentenced to transportation. Indeed, but for the dislike entertained by members of his sect to hanging a man, he would probably have gone to the gallows twenty-five years before; that being then the penalty for forgery.

In Australia intelligence and good conduct at length procured him emancipation. He took a shop in Sydney, and became rich as a chemist.

Returning, he settled in the neighborhood whence he had been expatriated, and the residents, considering his crime expiated, received him well.

The Society of Friends, however, declined his advances.

His second wife was, however, a Quaker of reputable family and character, and he assumed the garb of that sect and tried in every way to identify himself with it.

During his residence at Berkhampstead, a small town about seven miles from Windsor, he had built schools, founded savings banks, and promoted many schemes of benevolence. Probably a worse heart was seldom concealed beneath a sanctimonious garb and demure demeanor.

◆

SOME people have strange ideas of amusement. Minister Washburne gave a reception in Paris, in honor of Washington's birthday, and the most conspicuous decoration of the rooms, according to our foreign files, was a white muslin banner inscribed, "*Washington est mort!*" If this was not news it was at any rate history, like Artemus Ward's remark about Julius Cæsar, "Alas, he is no more;" but the unprejudiced mind will naturally inquire why the harrowing intelligence should be thus abruptly proclaimed in moments of revelry, and the funeral baked meats be made to coldly furnish forth the birthday festival? We all remember that uncomfortable banquet at which a grinning skull was regularly offered among the courses as a reminder of mortality. We remember also, the tears of Mark Twain over the tomb of our first father, Adam. Which of these two illustrious examples the Parisian banner most forcibly calls to mind we are hardly prepared to say, but we rather think it is Mark Twain.—*Tribune.*

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 6,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor.
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, MAY 2, 1870.

Ocean Cables—Do They Pay?

From the vigor shown in the extension of telegraph cable lines, the idea is naturally suggested that they are immensely profitable. It may be worth while to examine the actual results as ascertained from the records of the working of the great cables by which American communication with Europe is maintained.

The New York, Newfoundland and London Telegraph Company, whose lines extend from Plaister Cove, C. B., to Hearts Content, Newfoundland, and which is practically a part of the Atlantic Cable Company, was organized in March 1854, and has, therefore, been in operation over 16 years. During that period that Company has declared

Nine dividends of 2 per cent	18
One dividend of 1 per cent	1
One stock dividend of 16⅔, at stock value of 65 equal to 12 per cent	12
Dividends for 16 years	31

Or an average of less than 2 per cent. per annum

The original Atlantic Telegraph Company was organized in 1856, and has therefore been in existence 14 years. The only dividend declared by that Company was 3 per cent, in 1868. Within the past year the stockholders have consented to accept new stock at the rate of 16 cents on the dollar, and which new stock is now under par.

In 1864 the Atlantic Telegraph Company issued preferred stock in order to attempt again the laying of a cable. The holders of this stock have received up to this date:

Two dividends of 8 per cent	16
One dividend of 4 per cent	4
Or an aggregate of	20

Equal to 3⅓ per cent per annum.

The Anglo-American Telegraph Company was organized in 1866. It was called into existence to endeavor to recover the cable lost in 1865, and was guaranteed 25 per cent per annum on a capital of £600,000 if successful, and an option to purchase the stock thus issued within two years at 100 per cent advance. This purchase was not made, and the stock has, since the cable was laid, paid from 20 to 25 per cent per annum.

The French Cable Company commenced operations August 15, 1869, and in five months earned a dividend of 1¾ per cent, or at the rate of 4.20 per annum.

The united earnings of the Atlantic and French Cable and Newfoundland Companies, as now divided, it is true, yield more than legal interest, but if, as prudence would seem to render necessary, a sum were laid aside annually to provide against contingencies and the possible decay of the cables once in a decade, there would be no possibility of declaring dividends which could keep the stock at anything like its par value.

Returns since the last reduction of the cable rates show what we have so often insisted on, that there is a limit to the transmission of dispatches even under the stimulus of reduced rates. The receipts are not now equal to those when the tariff was higher, and so far it seems impossible to attempt any further reduction if proper returns are to be made to stockholders. If the tariff were made so low that the large body of the European laboring class, who have so many representatives in the families of America, could use it, no doubt a large increase of messages would follow. But it should be borne in mind that to produce a revenue equal to that now received, a reduction of 50 per cent on the tariff must be attended by an increase of 100 per cent on the number of messages, and, indeed, of 120 per cent to make allowance for the increased labor this occasions. There seems no present design to try the experiment under such a necessity of multiplying dispatches, and we do not find fault therewith. We do not expect men to cast capital away, even for a supposed public benefit. Telegraph Companies are in no respect eleemosynary.

If there be a sphere for Governments in connection with the telegraph, it would seem to be in the provision of these great bonds by which nations are connected. We would not find fault if the treasuries of America and Europe were used to supply these great connecting links, placing them, without charge, into proper hands, to supply at the lowest rates, the means of international communication. If that cannot be done, they should give such possible practical aid as is consistent with the character of their design; with the future which, by their omnipresecence, they seem to anticipate; and with the power for good which their use conveys.

◆

Longitude by Telegraph.

We have before us the report of Benjamin A. Gould to the Superintendent of the U. S. Coast Survey, one of the issues of the "Smithsonian Contributions to Knowledge." The opening chapter is headed "Origin of the Coast Survey Expedition," and thus begins:

"The determination of longitude by means of the electro-magnetic telegraph, was, as is well known, first practiced by the U. S. Coast Survey; and the methods by which it attained its full development were here in use for several years before they began to be employed elsewhere."

Professor Gould also communicates to *Silliman's Journal* the statement that the adaptation of the telegraph to the ascertainment of longitude was suggested to Prof. Morse by M. Arago, while the former was in Europe. Now, if it be worth while to state such matters in standard journals at all, and by which they become historic, they should be stated with the utmost correctness and precision. Failure to do this obliges us to correct Prof. Gould in both of his statements:

1. It was Prof. Morse who suggested to M. Arago, not M. Arago to Prof. Morse, the availability of the telegraph for determining longitude.

2. The first determination of longitude was made by the Government line between Washington and Baltimore in 1845, Prof. Morse and Mr. Vail being at the Washington terminus, and Captain Wilkes and Lieutenant Eld of the U. S. Navy, serving at Baltimore. Four years afterward the U. S. Coast Survey commenced its work, and we had the honor of placing the first wires at the disposition of Mr. Walker, the Government representative for that purpose.

◆

APRIL 27 Professor Morse completed his 79th year, and from 3 to 6 P. M. his beautiful home in New York was crowded with the *elite* of the city to offer their congratulations. There must have been at least one thousand callers during the afternoon. It was a fine sight to see Prof. Morse, William Cullen Bryant, Peter Cooper, and Dr. Morse of the *Observer*, all men far beyond the allotted span of life, laughing together as if they had the special benediction of a new youth given to them. Prof. Morse especially looked bright and young, as if he might reach the completion of a century unbent. "Long may he wave."

◆

THE Morse testimonial fund project has been well received. In our haste we neglected to assign committees to Iowa, Indiana, and W. Virginia. We therefore name the following:

Chas. C. Whitney, Indianapolis, Ind.
R. S. Fowler, Dubuque, Iowa.
McKelvey, Wheeling, Va.

We acknowledge remittances from John Horne, Jr., R L. Ferguson, John Coyne, and George Muttart. These gentlemen have sent to us direct, and any others may do so who desire. Dunkirk, N. Y., also sends us a list headed by J. A. Hughes, messenger; John McNeeny and Chris Wetz, repairers; T. W. Miles, W. H. Smith, and John A. Townsend, operators, in sums from one to three dollars. We have one or two choice letters which we will give in our next. Roll the ball on.

◆

THE Pacific Cable Bill will no doubt be granted by Congress, and if the grant of land is sufficient to induce investment, the cable will, no doubt, soon be laid. Without generous aid from Government we doubt whether capital can be secured for an enterprise which, although it gives communication with the densest population of the globe, must depend for its returns upon a few large cities until Asia is thoroughly aroused to the fact of its connection with the civilization of the world. We trust, therefore, that Congress will act nobly and generously, and both by cable and steamship give the commerce of Asia and the Pacific to America.

◆

THE new proprietors of the telegraphs appear to be making rather a "hash" of their management. The other day an Edinburgh firm sent to London a telegram concisely and clearly worded. Twenty-four hours afterward it reached its destination in the following condition: "Case answer take that cannot points up lifferent come in must of on it. be a to-morrow last-stated sum send letter at was us ground once accepted definite. We C. for instructions are letters furniture to to bear." *Judy* is afraid there must be a trifling mistake somewhere.—*London Judy.*

ANSWERS TO CORRESPONDENTS.

Rule 6.—Where messages contain amounts or numbers, customers are required to write them in words, but are not required to duplicate them in figures. Operators will hereafter neither transmit figures in the body of a message over the line, nor duplicate them in copying the dispatch. The use of figures in the body of a message is to be wholly dispensed with.

Rule 8.—When the sender of a message writes his address under the signature, are operators required to transmit?

Yes. Messages must always be sent as they are written. Anything written after the signature should be counted as a part of the body of the message. The only words entitled to be sent free are the date, address, and signature. The date includes the name of the place, town, or city where the message originates, together with the month and day of the month. The address includes the name of the person to whom the message is sent, together with the name of the street, number, and place of its destination. The signature simply includes the name of the person or firm who sends the message. If more than one signature is attached to a message, all except the last must be counted as a part of the body of the dispatch. If the address of the person or firm sending a message is written under the signature, such address should be counted as a part of the body of the dispatch. Example:

Syracuse, April 16, 1870.

John Doe,
16 Pine Street,
Chicago:

Have you sent instructions? Am out of money. Answer immediately.

Richard Roe,
Thirteen Howard Street.

13 words.

Thus counting the three words following the signature. If the customer does not wish his own address to be transmitted with his dispatch, but gives it for the purpose of facilitating the delivery of the reply, the receiving clerk will make a memorandum of the address, and send it to the delivery clerk, who will record it in a book kept for this purpose. Under such circumstances the sender of the message should be required to erase his address from the message.

Rule 14.—Can half rate messages be received at Western Union offices for places on another line by the payment of half rates for this line and full rates for connecting line?

No. Messages to be transmitted at half rates will be received *only for stations on our lines* in the United States, east of the Mississippi River, including St. Louis. *Half rate messages will not be received for transmission from, nor for, any other telegraph line, without special arrangement, of which due notice will be given.*

Rules 31 and 40.—Are operators required to make a duplicate copy of an insured, repeated, or cable message, and file the repeated copy with the original?

Yes.

An inquiry is made as follows: "How many words are contained in the following:

"24 x 36."

This written out would read "twenty-four by thirty-six," and comprises five distinct words. We see no authority in Webster regarding twenty-four as one word. In figures, the example given would be five words also.

Another correspondent asks: "Shall I charge for the word 'answer' in the body or as an appendix to a message, or send free, as I find many offices doing?

Answer.—Charge it the same as any other word.

The Boys on the Isthmus.

We have before us a long and interesting letter from Mr. W. Clark, who, with our friend Gustin and others, attended the Government surveying party to Panama to find a practicable route for an oceanic canal. The first route had been abandoned, and a new one projected by way of the Morti River. If that is not found feasible, the whole party will abandon the Caledonia Bay region, and go to San Blas, sixty miles south of Aspinwall, to make a trial there. That will settle the question of a canal, perhaps, forever.

Meantime the party flourishes and confess to an abundance of every species of fruit, eggs, chickens, ice, wines of all kinds, tobacco, fish, turtle, turkeys. Mr. Clark says: "The climate is perfectly delicious, always a splendid breeze blowing, and I sleep every night under a double blanket." The coral snakes visit them in their beds, and their donkey trains are sometimes stopped by baboons, twenty of them having at one time attacked a train, but the white men usually come out ahead, and Mons. Bab has to fly or die.

The party expect to return in July.

◆

Charles Williams, Jr., of Boston has imported a large supply of the Leclanche battery, full notice of which has failed to reach us, although mailed.

◆

Bliss, Tillitson & Co., Chicago.

This well known firm, of whom we have had occasion to speak more than once before, have been compelled by enlarging business to give up their extensive rooms in South Clark street, Chicago, and occupy four stories of the large building opposite the Lumber Exchange, 247 South Water street. The floors are 35x20, with a large independent entrance on the street, and in every way eligible for the large and varied products of this enterprising house. Nothing could better illustrate the reputation the firm has achieved in so short a time, and which gives us great personal pleasure to record.

L. G. Tillitson & Co., 11 Dey street, New York, have recently received a supply of the best made and finest resistance coils, and galvanometers of the utmost delicacy procurable even in Europe. Magnets made by this firm will hereafter bear the measure of resistance, and be furnished as desired.

Two hundred miles best quality No. 8 galvanized wire, now on hand, are offered at 6 cents per pound in gold. Nos. 9, 11, and 12 at lowest market rates.

◆

Electric Cable Facilities.

The Anglo-American Cable Company, in response to the petition of the Liverpool merchants, have promised to run a direct telegraph line from Liverpool to Valencia, Messages for America will not then be delayed by transmission first to London, as is the case at present.

Mr. Blacklock, formerly connected with the Electric Telegraph Company, has been appointed Superintendent of the Atlantic Cable Company.

◆

Persons seeking telegraph investments may find a rare chance by consulting page 137.

◆

An ordinary magnet loses its magnetism when heated. But molten cast iron, surrounded with a helix, through which a strong galvanic current is sent, becomes strongly magnetic, and retains its magnetism as the current is continued. This fact has been discovered by M. Treve, who draws some important inferences as regards the magnetism of the earth.

◆

The prospectus has appeared of the Manilla and Hong Kong Submarine Telegraph Company (Limited) with a capital of £350,000 in £10 shares. It is proposed to lay a cable 660 miles in length from Hong Kong to Manilla, having connections throughout the Philippine Islands, by cable and land lines, to a further extent of 470 miles.

TARIFF BUREAU.

Semi-Monthly Circular.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
May 1, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since April 16, the date of the last tariff order. Please note them in your tariff book:

NEW OFFICES.

140. Armstrong Run, Pa.
21. Amesbury, Mass. (See "General Information.")
21. W. Amesbury, Mass. (See "General Information.")
347. Bath, Ill.
33. Brentwood, L. I. (See "General Information.")
133 Covington, Va. Reopened.
200. Carlisle, Ind.
Edgerton, Col., 100 more than Denver, Col.
123. Goshen Depot, Va.
76. Highspire, Pa.
133. Lexington, Va.
410. Marshfield, Mo.
Middleton, N. S. Tariff same as Berwick, N. S.
Musquash, N. B. Tariff same as St. John, N. B.
Newport, R. I., formerly an "other line" office. Tariff same as heretofore.
466. Ottawa, Kansas.
Pond Creek, Kansas. Reopened. Tariff 160 more than Lawrence, Kansas.
130. Red Hot, Pa.
142. Rockbridge Baths.
317. Streator, Ill.
Slingerlands, N. Y. Tariff same as New Scotland, N. Y.; that is, 30 and 3 more than Albany, or 50 and 4 more than Binghamton, whichever gives the cheaper rate.
Lake, Bijou, and towa, Col.—The tariff to these offices from all points east of Kit Carson, Col., will be twenty-five cents more than the rate to Kit Carson. The tariff from points West, South, and North of Denver, Col., to same will be twenty-five cents more than the rate to Denver. The rate to Kit Carson is $1 80 more than Lawrence, Kansas, for all points east of Lawrence.

OFFICES CLOSED.

Middle Haddam, Conn.; Eagle Tail, Col.; Ridgefield, Conn.; York, Ala., and Fort Wallace, Kansas. Business for Fort Wallace will be delivered from Pond Creek, Kansas.

GENERAL INFORMATION.

Use "special" rate or "local" rate to Newburyport, Mass., for Amesbury and West Amesbury, Mass., if less than rate to square 21.

Offices in District A. and offices in squares 7 to 40 inclusive, and 45 and 46, will collect 15 cents more than rate to square 41, for Brentwood, L. I.

Hereafter the rate to Irving, Kansas, will be 55 cents, and Waterville, Kansas, 60 cents more than Atchison, Kansas.

West Wareham, Mass., and Tremont, Mass., are two names for the same place. The office is known as Tremont, Mass.

Attention is particularly called to this and the last paragraph. Cairo, Ill., is in square 320, not 330, as printed in the Tariff Book. Notice of this was given in Journal of September 1, 1869. Many offices neglected to change the square in their books, and consequently have checked Cairo incorrectly.

A number of offices check Calais, Me., on business for points east in N. B. and N. S. This is incorrect. Offices to which rate is given in "Remarks" column of the books as "—— more than Calais, Me.," should be checked direct, unless otherwise stated.

WILLIAM ORTON, President.

Telegraphers' Mutual Life Insurance Association

ASSESSMENT NO. 12.

W. H. Sawyer,
M. Buell,
L. A. Louis,
Thomas Hatch,
C. H. Welch,
S. C. Parsons,
J. B. Louis,
Orville Dodge,
T. W. Bangham,
T. D. Gibbons,
J. H. Pearce,
J. E. Selden,
G. S. Brooks,
E. B. Clarke,
C. Fox,
C. Corbett,
W. H. Stanton,
J. C. Sullivan,
J. C. G. Hamley,
L. B. Dwight,
John Beamer,
Geo. W. Belt,
C. V. Lamb,
J. D. Easterlin,
J. A. McKee,
F. C. Vandusen,
J. R. Dornell,
Ed. McCarthy,
R. M. J. Paynter,
Jas. McGovern,
N. C. Panystio,
W. S. Taylor,
Geo. B. Gaines,
T. L. Crouch,
Geo. B. Pace,
T. A. Pace,
J. D. Alley
Geo. W. Alley,
J. J. Fowler,
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◆

ELKHART, Ind., March 24, 1870.

J. D. REID, *Esq., New York.*

DEAR SIR: My views upon the question of limitation are to admit all operators who desire to join, and pay all collected to the families of deceased members until the membership reaches 1,000, then limit the amount to $1,000. Let the assessment be the same until the membership reaches 2,000, then we have enough in treasury to pay two assessments, and an association which will be easily sustained.

Yours truly,

J. BABCOCK.

◆

Freaks of Electricity.

FORT SCOTT, Kansas, March 12, 1870.

R. C. CLOWRY, *Esq., Superintendent.*

DEAR SIR: About twelve o'clock last night the wire south of here to Girard, sixteen miles in length, became charged with electricity. The wire was disconnected at the time, but was hanging very close to the ground wire. The manifestation of electricity commenced by a flame of light proceeding from the end of the wire toward the ground, and accompanied by reports considerably louder than a firecracker, continuing the discharge every few seconds as long as I kept it at a certain distance from the ground wire. When I touched it to the ground wire it emitted a continuous flame, about the size of an ordinary lamp, accompanied by a hissing sound and a sulphurous smell. All this time the wire made a peculiar sound, similar to that caused by gas when escaping from a burner. I touched it once with a lead pencil and got badly shocked; after that I used a long stick. By moving the wire six or eight inches from the other wires it would stop the flame and reports, but the peculiar burning sounds continued all night. Next morning I touched it to the ground wire and it burned just the same as during the night, but not quite so strong. About ten o'clock A. M., it gradually died out.

Yours respectfully,

M. M. HERRINGTON.

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BANGOR, Me., March 17, 1870.

Editor Journal of the Telegraph:

SIR: Having for some time experienced the inconvenience which many telegraphers find in taking reports, from their sheets becoming scattered over the table, I have at last contrived a plan which may be new to some, and which has proved, in a month's constant use, very convenient. I make a holder by taking a sheet of tin as long and a little wider than the paper used, and fold the edge over, leaving room enough for from 20 to 30 sheets in the groove. As each sheet is filled it is slipped out at the top, and the next is ready for use.

N. C.

◆

Born.

CARTER.—To John D. Carter, Orleans, Ind., April 4, a daughter.

TELEGRAPHIC CONTROVERSY.

Augustus Van Buren agst. The Great Western Telegraph Company, et als.

From the Chicago Tribune, Friday, April 1, 1870.

This is a proceeding instituted on the chancery side of the court, to set aside a variety of contracts relating to the construction of the lines of the Company, and to appoint a receiver of its effects.

The complainant states, that on the 2d day of December, 1867, Josiah Snow, Seelah Reeve, and David A. Gage became a corporation, under the name of the Great Western Telegraph Company, by virtue of their compliance with the general incorporation act of the State; the certificate of incorporation showing as shareholders, Valentine F. Gardner of New York, one share; John Dwight Johnson of Brooklyn, one share; Josiah Snow of Chicago, 1,000 shares; Hasbrook Reeve of New York, 100 shares; Seelah Reeve of Chicago, 117,897 shares; and D. A. Gage —— shares. It is stated, however, that excepting Gage, Seelah Reeve, and Snow, none of the parties signed the original articles of association, nor any other paper agreeing to subscribe for stock, excepting as they signed articles under a New York law, and that neither of those who have not signed have paid anything for the stock so subscribed. Under this organization, Gage, Snow, and Seelah Reeve took office as Directors of the Company, and managed its affairs; and on the 10th of April, 1868, as such Directors, they executed a contract, by Seelah Reeve, with James Van Buren, the purpose of which was that he should procure subscribers to the stock: under which contract he proceeded and obtained subscriptions for about 20,000 shares, upon which shares, under the contract, he should have received 50 cents per share, payment to be made in shares. Having so canvassed and so earned, he assigned his contract to complainant, as also his right to the shares. This assignment being made, complainant gave notice of it to Reeve, and made demand for the stock. A refusal to deliver followed.

It is stated that Gage, S. Reeve, and Snow were the parties principally engaged in the organization of the Company; that they procured their own election as Directors, and then continued to enrich themselves to the loss of the minority of the stockholders, to accomplish which purpose they contracted with Reeve to build the lines of the Company, upon such terms as absorbed the whole sum of the Company's stock, the contract being that he should receive 120,000 shares for 1,000 miles of wire extended—this number of shares exhausting the resources of the Company. Subsequently, by a second contract, they agreed to pay him $300 per mile for a single wire, and an additional $100 per mile for each additional wire; and, by a supplementary contract, he was guaranteed 25 per centum profit on his contract to build the line, the Company to make up deficiencies and to pay the expenses of collecting the subscriptions of stock. It is charged that the actual cost of such work does not exceed $100 per mile for a single wire, and $50 for each additional wire, per mile. It is also alleged that Snow receives an annual salary of $6,000, and that the employees of the Company are all his or Reeve's relatives.

It is also stated, as to the stock itself, that subscribers were to pay for it in installments, five per centum paid in (50 cents per share), and the balance upon the order of the Directors; but that when 40 per centum should be paid in, full paid stock should be issued—and now the Directors claim that calls can only be ordered by them. Wherefore, unless such a call be made to the amount of 40 per centum, certificates of stock cannot issue. Under which claim they make no call, nor have meetings of the stockholders, because it is provided that such a meeting shall not be held until 2,000 miles of wire shall be placed in order, when it is known that for the purposes of the Company no such amount of wire need be stretched. It is stated that a few hundred miles have been built, $120,000 paid in, and the Company is doing a profitable business, although it has declared no dividend.

The charge is that complainant is defrauded by the non-issuance of stock to him, and that the Directors propose to absorb the Company by making expenses which go into the pockets of the Directors.

It is sought to declare the contracts with Reeve void, and to procure an accounting and issue of stock.

Journal of the Telegraph.

Obituary.

Died, at Littleton, N. H., on the 29th day of March, Miss Lisiades Atherton, in the 19th year of her age.

Thus have the portals of Heaven opened to receive one of the noblest and truest of her sex, and the Telegraph Fraternity have lost one of their brightest ornaments. The deceased commenced the art of telegraphy at Hastings, Minnesota, at the age of 16, under the supervision of her best earthly friend, Miss Lou Leduc. Her proficiency was remarkable, and her ambition to give the lie to the oft repeated remark that a lady never made a good sound operator, encouraged her to zealously adopt every new improvement, and practice, it until she could equal any male operator on the line. Her manipulation of the key was firm and faultless, and her copy plain and business like. After a year's practice at Hastings, she came to Milwaukee, and worked one of the main Chicago lines, and accomplished the difficult feat of sending with one hand and numbering and timing the message with the left hand at the same time with perfect ease. But unfortunately for the Company, after having risen to the distinction of a number one operator in every sense of the word, her health, which had never been good, commenced to fail, and she was obliged to leave the business and seek the hills and mountains of New Hampshire, where her life has quickly ebbed away. Her remains were taken to Minnesota, and buried at her home.

"Though lost to earth, to memory never."

W.

In our notice of the death of Richard Schutt, we designed to speakly kindly and respectfully of him. No man can afford to speak otherwise of the dead. Especially is this so of weak men who are often so from the excess of qualities, in themselves, generous and good. Yet our notice touched one heart roughly. We regret it, because, had we known all the truth, we would have written differently.

It seems that since he left the service, Mr. Schutt's habits essentially changed, and a desire to lead a nobler life had taken root in his mind. This redeems his memory. To struggle upward is always ennobling. It is most so with those who fail. It is to them that the Great Hand comes down and uplifts. That uplifting Hand we need ourself as much as any. So we leave our brother in the hands of Him who is the world's great restorer, and in whom, at last, he trusted.

◆

A National Testimonial.

Our friend, Prof. S. F. B. Morse, the telegraph inventor, is, we are gratified to see, about to be the recipient of a national testimonial. The telegraph operators are at the head of the scheme, and it is to be hoped they will meet with every encouragement to enable them to carry it out to the credit of themselves and the nation, and the honor of the greatest inventor of modern times.—*Poughkeepsie Daily News, April 9, 1870.*

◆

Let Congress keep its hands off the telegraphs, and everything else that the people can do for themselves, and capital will flow to those employments which offer it the best return, and those telegraphers and others who serve the public best will receive the largest profit. Only let Congress throw the field open to all the world, subject only to such precautions as may be needed to prevent interference with the use of the public and other roads, and the people will soon supply their own needs. In most cases England affords an example *not* of what should be followed but of what to avoid; only here and there where she gives us the wise example of non-interference, there it is that our sapient legislators and advisers refuse to follow in her lead!—*The Exchange, N. Y.*

◆

The prospectus has been issued of the Lisbon Repairing Dock Company (Limited) with a capital of £100,000, in £10 shares, to purchase a patent slip at Port Brandao, on the Tagus, opposite Lisbon.

A new general theory of the production of electricity was submitted by M. Delaurier to the members of the French Academy at a recent meeting. He asserts that it is heat which, polarizing bodies, is the general source of static and dynamic electricity; that, under the influence of heat, active bodies, which are bad conductors of electricity, produce static electricity; while active bodies, which are good conductors of electricity, produce dynamic electricity; that friction, pressure, and chemical action produce heat, and that it is this heat alone which is always the cause of electricity. This new theory joins many phenomena together which the multiplicity of theories has hitherto kept far apart—chemical, thermo-electric, and physiological currents; static electricity produced by friction, pressure, cleavage, capillarity, electric fish, storms, etc.

◆

In the summer of 1866 it occurred to Mr. W. Hughes that the heat received on the earth from the stars might possibly be more easily detected than the solar heat reflected from the moon. Toward the close of that year, and during the early part of 1867, he made observations with thermopiles, and a very sensitive galvanometer, prepared for him by Mr. Elliott, and succeeded in obtaining trustworthy indications of stellar heat in the case of Sirius, Pollux and Regulus.

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All Signals connected with the Railroad service should be uniform, conspicuous, and ready to display at a moment's notice. Under the present system when an operator receives an order to detain a train, he has to take his flag, hunt a suitable place to stick it up, and keep running out every minute until the expected train arrives, to see that his flag or lantern don't get misplaced, or the view obstructed. More accidents occur from the proper signals not being shown than by any neglect on the part of operator or trainmen. The importance of having those Signals placed in a conspicuous position cannot be overestimated; it is the basis of all train dispatching by telegraph. This long needed improvement has been supplied in

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MESSRS. McKEE & CO.

The SIGNAL BOX got up by Mr. William McKee has been in use on this road for the past year, and gives general satisfaction. The facility with which the flag or lamp can be displayed and the operator remain beside his instruments, its safety, simplicity, and durability, recommend it as an invaluable adjunct in working a railroad, and I cheerfully attest to its merits,

Chas. R. Peddle,
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We have many other letters of a similar character.

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I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organised under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and the payment of dues.

XI. A meeting for the election of officers shall be held annually during the first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written request of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

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4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

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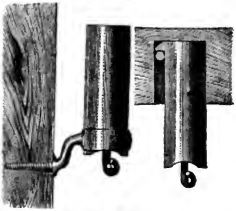

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2d. To insulate a conducting wire of any length in rain or fog or rain and fog combined, to its full working capacity, or the capacity of a similar wire or conductor placed upon any other insulators under the most favorable circumstances of weather.

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JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 12. NEW YORK, MAY 15, 1870. WHOLE NO. 61.

GALVANIC BATTERIES

"Pila da Callaud."

There have been within the past few years a variety of batteries invented in France; some of them have been used to a very considerable extent, among which may be mentioned the Sulphate of Mercury and Graphite Battery by Marie Davy; the Peroxide of Manganese by Leclanche, and the Gravity Battery by Callaud. These elements are referred to in Ganot's physics as "new batteries."

At one period the Telegraph Department used either the Sulphate of Mercury or the Peroxide of Manganese element, and later the Callaud was introduced into the service; each of these inventions had its advocates. Every requisition upon the department for battery materials specified the kind of battery desired; they were all for the same purpose, but there was great diversity of opinion as to their merits. Essays were published setting forth the advantages of each kind over the others; this difference of opinion soon became a matter of serious annoyance and embarrassment to the Administration, and to settle the vexed question a Commission was appointed by the Director General of Telegraphs, Vicomte de Vougy.

This Committee was composed of the most competent and practical electricians in France; it numbered twelve persons; M. Gaugain was chosen President and M. Abel Guyot, Secretary.

The advocates of the different systems were required to set up their favorite batteries, which were put to work and results were compared.

The Commission commenced their labors on the 8th of June, 1868, and finished on the 9th of November following, and made their report to the Director General, who immediately issued an order that all supplies for battery material should be from that date of the element known as "*pile de Callaud*," and the battery controversy, for the time being at least, was put to rest.

There were two reports made, one by the President, M. Gaugain, and another by M. Guillemin, each equally conclusive as to the results obtained by the commission.

The report of M. Gaugain describes the various methods by which the electro-motive force of each element was determined, and, making that of a Grove cell 100, they stand as follows:

Grove,	100
Marie Davy,	76
Leclanche,	82
Callaud,	56
Daniels,	56

Which means that a Grove cell has the same strength or will produce, on a circuit one hundred miles in length, the same deflection as a Daniel would on a circuit 56 miles in length, or again, that two Daniels would produce, in a circuit 112 miles in length, the same deflection as one Grove would in a circuit of 100 miles, and so forth; of course, leaving out of question the fractions of resistance in the different elements themselves.

There were no researches made with the Grove, but we give it here as a unit, to show approximately the relative electro-motive forces of the different systems in presence.

We will now view the important points examined by the Committee.

Constancy.—How long do the different batteries work before having to be renewed?

With Marie Davy the electro-motive force fell from 253, on the 1st of June, to 247 on the 27th of October, on an open circuit; but the current is always very irregular in a closed circuit; it *polarises rapidly*, or, in other words, the current is weakened or neutralized by local counter currents and gas bubbles upon the surface of the plates.

Leclanche's.—The same difficulty is found to exist with this element. When connected up in "short circuit," a weak resistance, its electro-motive force falls very rapidly; but when the circuit remains open for a great portion of the time, or when the resistance interposed is great, like the Marie Davy, it will answer a very good purpose.

Callaud's acts very nearly in the same manner, whether in closed or open circuit. Its electro-motive force fell from 194 on the 4th of June to 174 on the 3d of November. It polarizes very little when connected up in short circuit, weak resistance; but this feature is not perceptible, when the resistance is of the magnitude of ordinary telegraph lines. In this respect the Callaud's behaves very much like an ordinary Daniel's element.

INTERNAL RESISTANCE OF THE BATTERIES.

M. Gaugain says that with the Callaud, when set in spring or river water, the internal resistance is considerable; but as the water becomes saturated with sulphate of zinc, this resistance diminishes. He puts its minimum value at five and a half Seimen's units, which, for all practical purposes, we may call five and a half ohmads.

For the Daniels, when first set, he found as high as sixty Seimen's units, but its resistance fell rapidly, the minimum being between ten and seven units; this decrease depends very much upon the condition of the porous cup and the quality of the material. If dry and compact in its body, it is some time in becoming fully saturated. However, after complete saturation, M. Gaugain could not discover that it interposed much resistance, though he experimented carefully and upon the porous cups for that purpose.

He found that the less permeable or least porous cups answer the best in keeping the liquids separated and prolongs the action of the battery.

The resistance of the Leclanche, after full saturation of the porous cup, was about four ohmads.

In the Marie Davy the resistance is about six ohmads. It does not increase, as had been supposed, and M. Gaugain thinks that some savants have been led into error, in this respect, by experimenting while the battery was polarized, and that this apparent increase may have been accidental.

In conclusion, M. Gaugain says that Marie Davy's could be used for the work of one wire, but that its resistance is too great to have more than one line per battery.

He did not find this difficulty with the Leclanche. Its internal resistance is the least of all, but it polarises rapidly when traversed by currents of much quantity. M. Gaugain believes this could be remedied by increasing the size of the plates; he found the ammonia, generated when the battery is active, disagreable, and fears that those emanations might prove dangerous and even poisonous where many couples would be used.

The Commission found that the electro-motive force of the Callaud's did not decrease more than one-tenth in five months, and they think it would take a much longer period to wear it out. M. Gaugain, therefore, believes that it would be well to adopt it.

It requires the care of supplying it with sulphate of copper, but has the advantage of giving currents of various quantities without much polarizing.

EXTRACT FROM M. GUILLEMIN'S REPORT.

"A battery suitable for the purpose of the telegraph, should not fail in its energy to an appreciable extent for the space of five or six months.

"It should not have too great an internal resistance, as it is this feature with which we have to deal in working more than one wire from the same battery. The less the internal resistance of the battery and the greater the external resistance of the wires, exactly in these proportions is the number of wires which can be worked from or supplied by the battery.

"The resistance of the wires is variable, and results from imperfect insulation. This cause reduces the circuits, often to half, sometimes to one quarter, and even to a smaller fraction of their proper resistance.

"The battery should, under these unfavorable circumstances, give a sufficient *quantity*.

"The different batteries, which have been measured and compared side by side, are the Marie Davy, the Daniel, the Callaud, the Leclanche, and the Meidinger.

"These comparisons were made with intermitting currents, in which the circuit was broken and closed by Foucault's automatic arrangement, at the rate of *four to five* times per second. The resistance in the interpolar, the wire resistance, was about seven and a half Seimen's units per element.

"The larger sized cells or elements have least resistance, and give more regular or constant currents. They are preferable.

"Callaud's large size is the only one remaining regular in its action during several months. Its electro-motive force decreased only about one-fortieth of its normal value during a period of over three months. This loss was more than compensated by the decrease of its internal resistance. It is the only battery which presents these excellent qualities.

"Daniel's battery is irregular. This is due to the rapid incrustation and deterioration of the porous cups.

"Marie Davy's.—This battery is unfit for good service, for two reasons. When the line resistance is weak, and short circuit, its electro-motive force diminishes very rapidly, and its internal resistance increases rapidly, so on a whole, or taking these two features into account, it loses its energy. It will, however, recover a portion of its initial force when the circuit has been opened for a time.

"The Leclanche polarizes less rapidly than the Marie Davy. Its energy is well maintained when the resistance of the circuit is not too weak."

The foregoing reports were published about a year since. The report of M. Guillemin appears to be more recent and supplementary to that of Mr. Gaugain, President of the Commission.

From advices received from France up to the present writing, we learn that the Callaud battery has given very general satisfaction, and has now superseded all others.

The Callaud battery costs about half that of Daniel's, and is fully twice as enduring or constant, so that its ultimate cost is only about one quarter of the Daniels.

The question arises as to what extent is this element adapted to the American service.

The conductivity of the wires used in France for the main circuits is about three times that of an ordinary American No. 9 wire. They are five millimetres in diameter, a size between the Nos. 3 and 4, Birmingham gauge. Practically, a wire of this dimension carries a current three hundred miles, with no more dimination in strength than a No. 9 wire one hundred miles. This feature is against working many wires from the same battery, because they take a greater quantity of the current; on the other hand, the insulation is from two to three hundred times higher on French than on American wires in rain. This point favors the working of a number of wires from the same battery. Both these facts taken into due consideration, it is probable that, in France, a greater number of wires of equal lengths can be worked without interference than in America.

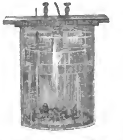
The next thing to consider is, to what extent the Callaud element is adapted to work our sounders and registers. The strength of the Callaud, its electro motive force, is the same as that of the Daniels, and compared to a Grove, nearly as 56 is to 100.

The resistance of a Grove is about one ohmad; the resistance of the Daniels, the largest size used in this country, is about two ohmads, and when it is less it is owing to an excess of porosity of the porous cup.

A sounder, to obtain the greatest force and action, should have equal resistance to the battery,—that is, "*In any given combination, the maximum effect is obtained when the total resistance of the element is equal to the resistance of the interpolar.*"

As a consequence of this law, a sounder, to produce the greatest effect with one Grove cell, should have coils giving about one ohm resistance, the connecting wires being such as to offer no appreciable resistance. This sounder is not adapted to a Daniels; because the Daniels has two ohms resistance: but, if two Daniels were "doubled" so as to make one cell of the two, the resistance of each, being two ohms, is decreased by half, and then becomes one ohmad. The sounder then is adapted to the resistance of the battery, and the greatest effect is produced. The effect, compared to the Grove, is as 56 to 100.

When the Callaud cell has a circle of 5 inches in diameter, and two diameters, or four spokes instead of two, as represented in the figure, its minimum resistance is about two ohmads. If the cell is sufficiently large to give twice the metallic surface on the liquids, and the zinc placed four inches above the copper, as in the former case, then the resistance will be reduced to one ohm, but an element of this size costs more than two of the former. The sounder to be adapted to the Callaud should have a resistance of two ohms, or rather that resistance should be appropriated in increasing the convolutions of copper wire around the helices of the magnet. A well made magnet of two ohms resistance will perform the required functions with one Callaud cell; but if greater force is necessary, as for registers or repeaters, the coils should be enlarged slightly, and wound with smaller wire, giving four ohms resistance. Then the coils are adapted to the battery, and the greatest effect is obtained by alternating, that is, connecting copper to zinc in the usual way.



The resistance of the battery, which is then two ohms per cell, equals that of the sounder, which is four ohms.

Most sounders, in this country, are made of thick wire, giving about one ohm resistance. This is the form and size which develops the greatest amount of power with one Grove cell. Doubling the size of the cell, the resistance decreases by half. The total resistances in the circuit are lessened in the same proportion, and the effect in the sounder is proportionately increased. But the size of this cell renders it more costly than two ordinary ones, and soon becomes exhausted. If we used two cells, the resistance of each being equal to that of the sounder, and connected in the ordinary way, the effect would not be proportionately increased, because the resistance of the battery is greater than the resistance of the interpolar.

The electro-motive force of the Callaud being but a little over half that of the Grove, as a general rule, two Callauds will be required to produce the work of one Grove; but it is safe to say that they would be ten times as enduring, and at one-fourth of the cost.

Concluding, we would say, that the number of wires which can be worked from one battery is in inverse ratio of the resistance of the battery, and in direct ratio of the resistance of the wires. Making the resistance of a Grove cell one ohm and the Callaud two, four times the number of wires can be worked with the Grove than by the Callaud. The economy, then, is vastly in favor of the Callaud.—*Scientific Journal.*

◆

The attractive power due to electric magnets decreases rapidly when the distance between the armature and the magnet diminishes. Operators, do you bear this fact in mind when you throw your magnets away from their armatures (in wet weather) to enable you to adjust over heavy "escape?"

Steam to be Superseded by Electricity.

The New York correspondent of the Boston *Journal* describes a new invention for displacing steam by electricity, and says that lathes, planing machines, and other mechanical arrangements are driven by this power. To run an engine of 20-horse power by this invention would require only a space of three feet long, two feet wide, and two feet high. The cost per day would be thirty-five cents. On a steamship no coal would be required, and the space now used for coal and machinery could be used for cargo. The stubborn resistance of electricity to mechanical use heretofore has, it is believed, been overcome. A continuous battery has been secured and other difficulties removed, principally through the coil of the magnet. If the invention works as well on a large scale as it does on the machinery to which it is now applied, steamships will soon ply the ocean under the new propelling power. A machine of great capacity is being constructed, and will soon be on exhibition in New York. The whole thing, mighty enough to carry a Cunarder to Liverpool, can be secured in a small trunk.

[The above paragraph has been sent to us by several correspondents, asking our opinion in regard to it. We consider it sensational, and not worthy serious attention.]—*Scientific American.*

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Preservation of Telegraph Poles.

The preservation of the large number of wooden poles in use for carrying the conducting wires has become a very important subject. M. Delarge reviews the use of the following substances employed for the purpose: *Sulphate of copper.*—On inspection of a large number of poles treated with this substance, it was found that, notwithstanding nearly twenty years' service, the wood was in a very excellent state of preservation; but it should be added that very much depends upon the kind of timber used for the purpose, and upon the period of the year when it is cut down. *Creosote* is very extensively applied, and, according to a series of comparative experiments, purposely instituted in Belgium, during the years 1861 and 1862, the durability of creosoted timber is considered equal to that treated by sulphate of copper. Creosote, however, is found to be, in many instances, very inconvenient, both on account of the odor it emits, and on account of the injury caused by its corrosive action upon the hands of the workmen, *Chloride of zinc.*—According to the experience of the Netherlands officers of the Waterstaat, to whom is confided the *materiel* of the telegraphic lines of that kingdom, the use of chloride of zinc has given great satisfaction in the sandy soils of Gelderland; whereas, in more calcareous soils, chloride of zinc did not answer the purpose at all, a result also observed in Germany. According to M. Delarge there is a good deal of practical experience yet to be gained in this department of chemical engineering, since every day more and more proves that the nature and qualities of the soil wherein the poles and other timber, railway sleepers, &c., are placed has a vast deal more to do with the preservation of the wood than could be, *a priori*, conjectured.

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The steamship Edinburgh, the property of Messrs. Edward Bates & Sons, has just been fitted by Messrs. Laird Brothers, at their works, Birkenhead, for the service of the Telegraph Construction and Maintenance Company. Her dimensions are 290 feet long, 39 feet wide, and 26 feet deep; tonnage, 2,200 tons. She is now arranged with three large cable tanks, two of them being 32 feet in diameter by 22 feet deep, and the third 26 feet in diameter by 20 feet deep. Under the two largest of them there has been fitted an inner skin, forming a double bottom, for stowage of water, ballast when the weight in the cable tanks has run out. There are also various other fittings and appliances, specially arranged for the telegraph work.

TELEGRAPHS IN EUROPE.

Female Employment.—[Continued.]

From the Journal des Telegraphes.

It is therefore principally as managers of auxiliary offices that women participate in the telegraphic service in France. In the organization of the telegraph administration, as it exists to-day, the telegraph offices situated in localities other than in the chief towns, and whose services do not concern the works of the system, the choice of employees are trusted to the discretion of the principal Director.

1. The appointments are given to the old employees of the State, who have been engaged seven years in the military or civil service, or who, in case of a shorter term of service, would only have ceased in their performance through wounds or infirmity contracted in the exercise of their duties.

2. To the wives, daughters, or sisters of such employees of the State who have died during such active service.

To be admitted as managers of telegraph offices candidates must be at least twenty years of age, and not more than thirty-five. They must have an income of 500 francs ($100) per annum, and be able to secure the assistance of some member of their family able to take charge of their offices in the event of sickness or absence. If they can fulfill these conditions the Administration requires them to pass an examination in writing and orthography, and if such proves satisfactory they are then authorized to enter an office to be initiated in the different particulars of telegraphic operation. After a period of about three months—and during which time they receive no remuneration—they are then positively admitted, but only as auxiliaries; they do not figure on the lists of the *personel*, and they have no right to a retiring pension.

The advantages which are granted to these auxiliary agents are as follows: They are lodged gratis in the building of the telegraph office which they manage, and receive an annual income of 400 francs ($80), unsubjected to the reverses of civil pension laws; and this income may reach to 800 francs by a successive increase of 100 francs, beside which they receive an indemnity of 10 centimes (2 cents) for every private dispatch of departure or arrival, the transmission of official and service correspondence giving no remuneration. They receive, however, the allowance made to managers of stations of similar importance for office expenses; and in case of translocation in the interest of the service, they are entitled to indemnities for the journey and to such habitation as is granted to titular employees. Beside the conditions required for their admission, these agents are also obliged to furnish security on the same principle to titular employees—to secure without any further or special indemnity the correct transmission of telegrams to their destination.

As we have previously stated, female employment in telegraphy was first introduced in France in 1853. Since that time about two hundred offices have been committed to their care, and have been found to give entire satisfaction. The French Administration values the annual economy realized by this system at about 2,000 francs, or $200, for each office. The Administrations which make a more extensive use of this system of requiring women to participate in the operations of all offices are Denmark, Norway, Sweden, the Grand Duchy of Baden, and Switzerland.

Before speaking of any other Administrations, we shall give such information as we have received concerning the Administration of Wurtemberg, since the publication of our last number.

In Wurtemberg the triple services of railroads, postage, and telegraph are placed under the same control, and it is only where telegraph services are combined with postal or railroad service that females have been allowed to participate at the present time, but they are sometimes merely as auxiliaries of the employees, and sometimes as managers. Therefore, this system should be classed with that of Italy, Hungary, and France, which we elucidated in our last article. In the capacity of auxiliary the manager may employ women to distribute tickets, either postal or telegraphic, only under the superintendence and responsibility and with the authorization of the administrators, which then orders the necessary arrangements to this effect. When the manager selects one of the assistants from his own family he is allowed the annual indemnity, which in general does not exceed 100 florins ($43).

[*To be continued.*]

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Mysterious Disappearance of an Old Telegrapher.

George Stillman—well known ten years ago as an operator on the Lake Shore Railroad, and during the war as Government operator and Provost Marshal, and afterward as Railroad agent, Express Agent, and operator at Tullahoma, Tenn.—left his home on the morning of March 28th last, without a hint to any one of his intentions. He was seen in Nashville about three o'clock P. M. of the same day by two of his strongly attached friends, to whom he gave such widely different statements of the object of his visit as to make it seem that he could not have been in his right mind, and no trace of him has since been found.

At the time of his disappearance, and for more than a year previously, he had charge of a mercantile establishment at Tullahoma, and gave the highest satisfaction to his employer. He was Mayor of the town, serving his second term; superintendent of a Sabbath school, and an active member of the society of Good Templars. His business matters are found to be all right, and his domestic affairs were all that could be desired. The most thorough investigation fails to develop anything which should have caused him to leave home. His almost heart-broken wife and three children are left destitute of the means of support. The following brief description is given, in hopes that it may meet the eye of some one who will be able to give some trace of the wanderer: Age, twenty-nine; height, about five feet six inches; eyes, blue; hair, dark; had, when he left, sandy chin whiskers and moustache; wore a dark mixed business coat and vest, black cassimere pants, and a low-crowned soft hat; had a hunting-cased watch, marked on one side "G. S.," and on the other, "Father." He has an occasional stammering or hesitancy of speech, and, as a peculiar mark, has only one front tooth in the upper jaw, in place of the two which most people have. Any information leading to any trace of him will be gratefully received by his wife, at Tullahoma, Tenn., or by Jno. A. Townsend, Manager W. U. Telegraph Office, Dunkirk, N. Y.

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Presentation.

The lady operators connected with Miss Snow's department, 145 Broadway, New York, have presented Mr. Madison Buell with a beautiful silver pitcher, goblet, and salver. The occasion for this presentation was the care bestowed by Mr. Buell in the arrangements for the comfort and elegance of the ladies' operating room, which had been confided to his special care. All the comfortable and elegant look of a home has been given to it, and the entire arrangement illustrates the nice taste and skill of our friend and pitcher, who now owns a pitcher appropriately engraved with the name of M. B.

◆

A Magnetized steel bar, when brought to a white heat, totally loses its magnetism; should it have become magnetic during cooling, it is due to the action of the earth.

CLIPPINGS FROM SCIENTIFIC WRITERS.

By Madison Buell.

The first volta meter, founded upon the calorific effects of the battery, was contrived by M. Gaspard de la Rive.

All cases of combustion are to be ascribed to the collision of atoms which have been urged together by their mutual attractions.

The steam engine and the electric telegraph, the highest embodiment of human genius, are the legitimate object of scientific research.

The first experiment a man makes is a physical experiment: the suction pump is but an imitation of the first act of every new-born infant.

The direction of a magnetized needle is constant in the same place and at a given epoch, but it varies from one place to another, and changes with years.

The scientific man must approach Nature in his own way. If you invade his freedom by practical considerations, it may be at the expense of those qualities in which his success as a discoverer depends.

Ignite a piece of cotton and it flames, the oxygen unites with its beloved carbon; but an amount of heat equal to that which it produces by combustion was sacrificed by the sun to form that bit of cotton.

A German physician named Mayer, without external stimulus, and pursuing his profession as a town physician in Heilbronn, was the first to raise the conception of the interaction of natural forces; and yet he is scarcely ever heard of in scientific lectures, and even to scientific men his merits are but partially known.

The subject of physics proper are those which lie nearest to human perceptions—the light and heat of the sun, color, sound, motion, the loadstone, electrical attractions and repulsions, thunder and lightning, rain, snow, dew, and so forth. The senses of man stand between these phenomena, between the external world and the world of thought. He takes his facts from Nature, and transfers them to the domain of mind; he looks at them, compares them, observes their mutual relations and connections, and thus brings them clearer and clearer before his mental eye, until finally, by a kind of inspiration, he alights upon the cause which unites them. Having guessed the cause, he appeals to the law and testimony of experiment whether it be so. He traverses the line between cause and effect, and in doing so calls all his reasoning powers into play.

◆

A Youthful Operator.

Peter A. Smith, Manager Western Union Office, Carbondale, Ill., has a son 12 years old who writes well on the key and receives commercial and railroad messages by sound with astonishing ease and rapidity. This little boy's name is Eddie, and he has been practicing for the last three years.

◆

Hon. J. D. Caton resides in Ottawa, Ill., and has retired from an active telegraph service which has secured to him a large fortune. He has not, however, retired from active life. He is now President of the Ottawa Glass Company, organized in 1868, and of which our friend T. D. Catlin is the Secretary and Treasurer. This is the third glass establishment got up by our telegraph chiefs, George L. Douglas of Louisville, Ky., and Thomas H. Wilson of Philadelphia being connected with similar establishments in these cities.

◆

Sand Hill, Ill., April 28, 1870.

Editor Journal of the Telegraph.

Dear Sir: I heard Manager of Beardstown, Ill., office trying to find a cross between Beardstown and Chapin on a single wire. Can cross be found on single line? Answer through your next issue.

M.,
Manager Sand Hill Office.

Ans.—Not much. You must have mistaken the case.

The Philosophical Action of Magnetism.

The above is the title of a pamphlet recently published by D. Appleton & Co. of New York, containing an account of some novel and curious experiments by John Vansant, M. D., originally published as a contribution to the *Journal of Psychological Medicine.*

It is claimed that the investigations of Dr. Vansant demonstrate the fact that the force of a permanent magnet is capable of exercising an influence upon the functions of living beings. The idea that magnetism can produce a functional effect in living organism has occasionally existed as a vague notion, but has not obtained among the modern school of physiologists; yet it is admitted that electricity, heat, mechanical motion, chemical affinity, and light, are capable of affecting the functions of living beings, both animal and vegetable; all but the last-named (and that, too, perhaps) having the unquestionable power to produce even the death—cessation of all functions—of the highest animal. Dr. Vansant, therefore, maintains that analogy, before experiment, would indicate that magnetism, the *correlative* of these forces, would act in a similar manner if properly brought to bear, and we think the force of his reasoning will hardly be denied.

There are other strong reasons which support this view, among which the most noticeable is that Coulomb, Faraday, and others, have established experimentally the fact that all ponderable bodies, when properly placed between the poles of a magnet, take up, on account of the magnetic influence, either an axial or equatorial position, and founding thus the two great classes of magnetic and diamagnetic substances, ascertained that animal flesh and tissues generally belong to the diamagnetic class. From this Dr. Vansant reasons that if a suspended muscle, for instance, in its entirety, is turned by the power of a magnet from an axial into an equatorial position with reference to the poles of the latter, *every particle* of that muscle takes up a similar position; each fasciculus, each sarcous element, each atom, must take a new position at right angles to its former one; and that the result of this action, when followed out to its logical conclusion, must inevitably be that magnetism is capable of effecting a *molecular change* in animal tissues, and, as the functions of organs of all kinds must be considered to depend on molecular changes in their tissues, magnetism would be able to affect these functions.

We cannot, however, do justice in our limited space to the able line of argument by which the author of the paper under review establishes the fact that, from the nature of this force and its correlations to other forces, it is absurd to doubt its influence upon living organisms. Our readers will be more interested in the experiments instituted to prove that magnetism does exercise the influence attributed to it.

These experiments were chiefly made with straight bar magnets upon living vegetable and animal organisms. Dr. Vansant assigns as a reason for the non-observance of magnetic influence upon living beings the fact that the most ordinary form of magnet is the horseshoe or bent magnet, the proximity of the poles of which renders it ineffective for the purpose of such experiments upon large animals. We quote *verbatim* the description of one set of the experiments made with tulips:

"I took for experiment three small flourishing tulips (*Tulipa gesneriana*) in full bloom, flowers red, growing in the same pot within four inches of each other. These plants, which I shall designate as A, B, C, were about equally vigorous, almost exactly of the same size, and were watered and kept in a light room at a genial temperature. If there was any advantage in vigor, it was in favor of A. By means of a steel-bar magnet, capable of lifting with one pole about an ounce of iron, I applied *Boreal* (+) magnetism—the southward end—to tulip A, drawing the pole slowly from the surface of the soil in the pot to the top of the plant along the stalk and larger leaves, and repeating this maneuver for about three minutes. I then made a similar movement over tulip B, but substituted *Austral* (—) magnetism—the northward end—for that first used. Tulip C was left untouched. Almost immediately there was a contraction or shriveling of the petals visible in both of the plants touched, but especially in A. Soon, however, the contraction disappeared from B, while in A it continued unabated. About twelve hours afterward I placed a small straight magnet, some four inches long by one sixth of an inch in diameter, so that its + pole, resting against the scape of A, and its — pole against that of B, should keep up the same kind of magnetic action as first applied; and the instrument was left in this situation for thirty-six hours.

"At the end of that time the flower of A was very much withered, and evidently dying, the leaves of the plant were curled, the healthy green color was faded, and the whole had a declining aspect. The flower and leaves of B, on the contrary, looked equally as fresh and of as good color as those of C, which were untouched by the magnet; and even, I think, the flower was more expanded and the red of a deeper shade. After about eighty hours from the beginning of the experiment the flower of A was quite dried up, while that of B, though more shriveled than C, was far less withered than A. The green leaves of B appeared just as healthy as those of C, but the leaves of A were more than ever curled and pale."

Experiments were also performed with other plants, as verbenas, geraniums, etc., with somewhat different but no less striking results. To show the remarkable results attained by experiments upon the lower animals, we give the account of a single one made upon a common earthworm:

"I took a small, vigorous earthworm (*Lumbricus terrestris*), and applied to it, alternately, the southward (+) and the northward (—) poles of a steel magnet six inches long, able to raise about one ounce with either pole. At first the worm appeared much stimulated, especially by the — pole, as indicated by its stretching itself out to its greatest length. The alternate gentle touches with the magnetic bar were then rapidly repeated, and in about three minutes the worm coiled itself closely and immediately died."

A spider was killed by the rapid and alternate applications of the opposite poles of a small horseshoe magnet. Progressive experiments with animals of higher grade proved the universal influence of magnetism and the positive character of its effects.

A single experiment performed on the human body is all we shall extract from this interesting paper:

"Mr. M., a strong, unimaginative man, had facial neuralgia of malarial origin. I applied the — pole of the same small magnet last described over the seat of pain, for about one minute. In five minutes he complained of the pain being worse. I then made an application of the + pole, and in less than a minute the pain almost subsided. After about an hour there was a recurrence of pain for a short time, but much lessened in intensity. This person was led to *expect* relief by the *first* form of application."

From the results of these experiments Dr. Vansant constructs a table giving these organs which belong to the (+) class and those belonging to the (—) class, with the effects of *Boreal* and *Austral* magnetism applied to each part. These effects comprise a remarkable array of symptoms, and indicate that magnetism may yet take the high rank in the list of remedial agents.

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Magnetization may take place at a distance, as well as by contact.

The Rising and Falling of Dew.

Here is the simple and beautiful fact of the rising and falling of dew. Take, for example, a blade of grass, from which one of these orient pearls is depending. During the day the grass, and the earth beneath it, possess a certain amount of warmth imparted by the sun. During a serene night heat is radiated from the surface of the grass into space, and to supply the loss there is a flow of heat from the interior portion of the blade toward its surface. Thus the surface loses heat by radiation and gains heat by conduction. Now, in the case before us the power of radiation is great, whereas the power of conduction is small; the consequence is that the blade loses more than it gains, and hence becomes more and more refrigerated. The light vapor floating around the surface so cooled is precipitated upon it, and there accumulates, to form the little pearly globe which we call a dew-drop.

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The bill lately presented in the House of Representatives for an ocean cable between New York and Holland, under a concession granted by the King of Holland October, 1869, provides that it shall be continued from New York by wires over the continent of America, and by cable from the Pacific Coast to China and Japan: $10,000,000 7 per cent bonds to be issued for wires and cable from Europe to the Pacific Coast; $10,000,000 for cable from the Pacific Coast to Asia. The bonds are secured on the wire, cables, and property of the Company; the Government to use the wires and cables of the Company one hour each day without charge, and two additional hours, if needed, at half the tariff rates.

◆

The preparations for the expedition of the first section of cable to be laid by the Great Northern Telegraph (China and Japan Section) Company are making progress. The Danish frigate Tordenskjold has arrived in the Thames, where she will take on board a portion of the cable, for the remainder of which the company have chartered the steamers Cella and Great Northern. About 400 miles are now finished in the tanks, and the remainder will be completed by the time the ships are fitted up and ready to receive their cargoes. It is expected that before the end of May the whole will be on its way to China.

◆

A new kind of magnetic lantern has recently been constructed by Mr. Ladd of London, which shows not only the optical images, but also the spectrums given by the different metals placed in the electric arc. The apparatus contains two bisulphuret of carbon prisms, and an arrangement of lens which enables the operator to use it both as a magic and spectroscopic lantern. In all likelihood it will be generally used to illustrate public lectures.—*Scientific Journal.*

◆

A Swedish paper tells the story that the operator at the telegraph station at Maelmoll was discharged the service for the following reason: This operator one forenoon got into a violent altercation with an operator at Berlin. The Berlin man had been too slow in sending, and the Swede requested him to allow some one else to relieve him. As the Prussian declined to do this, an altercation ensued, in which the Swede, among other things, said: "In Sweden there is no military despotism." About this the Prussian felt insulted, and gave his superiors an account of the matter, and the Prussian Telegraph administration appealed to the Swedish, which, after demanding from the operator an explanation, discharged him from the service.

Phenomena of Storms.

Among the papers read before the National Academy of Sciences, at its recent session, was one by Professor Wm. L. Nicholson on "Some of the phenomena attending the great tornado thunder storm in Iowa, Illinois, and Michigan, June 3, 1860." The Professor, during the course of his reading, gave a detailed account of the manner in which the storm-clouds were formed, and the immense destruction which followed in the course of the tornado. The total number of miles traversed by the storm-cloud was 560, across the States above named; the cloud being in the shape of a cone or spout, which in many instances reached the earth, and tore up large quantities of black prairie mud, which it (seemed to incorporate with itself, as on every occasion in which the column reached the earth it assumed a darker hue. When the spout reached the Iowa River the spray was seen to come out of its apex, making a picture even more impressive than Niagara Falls. The evidences of the amazing power of the wind were innumerable. In one instance a joist was driven directly through a tree. At the time of the passing of the spout an odor of sulphur was noticed by many persons, and one of the most curious of the phenomena attending the storm was that many fowls were entirely stripped of their feathers, while the fowls themselves remained uninjured.

Professor Henry said that the paper was a very valuable contribution, as these storms, in our country, were more frequent than anywhere else, and that scientific men had been censured for not observing them more closely. The cause of these storms or spouts had not as yet been definitely determined. They might be caused from electricity, or they might be a disturbance in the equilibrium of the upper and lower strata of the air, which at times became surcharged with vapor, thereby causing the spouts and the spiral motion assumed thereby.

Curious Use of a Monster Magnet.

A great underground work is the Ernst August Gallery—one of five belonging to a metal mine in the Hartz. The mouth of it is at Gittelda, in Brunswick. It is 10 feet high, 6¼ feet wide, and has a fall three-fifths of an inch in a yard. Like a railway tunnel (but it is twice the length of the longest), it was begun simultaneously at various different points, and finished in thirteen years. The gallery is 6⅞ miles in direct length; but if its lateral branches are taken into account, and a subterranean gallery, navigable for boats, which opens into it, the Ernst August Galleries are said to be not less than fifteen miles long. All the junctions of the different sections fit accurately into each other, the precision of the results having been partly insured by the aid of a magnet, weighing 200 pounds, which influenced the compass through the solid rock 65 feet deep, and which was kept in one of the working-places, while the compass was held in the other.

Manifest Destiny of the "Great Eastern."

The hackneyed remark concerning the adaptation of the Great Eastern to laying ocean cables and nothing else has received, according to information from England, a fresh and quite forcible illustration. The vessel has been leased for five years to the "Telegraph Construction Company" for the sole purpose of laying submarine telegraph lines. This company does not work cables, but simply manufactures and deposits them to order upon their deep-sea beds. It is expected that the great ship will be kept busy in laying lines from San Francisco to the Sandwich Islands, and thence bifurcate lines to Japan and Australia; also many others, the aggregate of which constitute a work of greater magnitude than the building of the leviathan itself, which was considered so great an enterprise only a few years ago.

Invisible Light.

Many years since, a photograph was made, at Berlin, of the well-known bronze statue of the Amazon; and it was observed that, in the negative, a black streak occurred at the tip of the lance (held by the figure in an almost vertical position), while two other analogous marks appeared in other locations. This picture was sent to Professor Dove (Berlin), whose investigations in connection with light are widely known, and he came to the conclusion that these markings might be due to electrical discharges going on from prominent points of the figure at the time the picture was taken, and which, though invisible to an observer, would nevertheless, by reason of the high actinic power of electric light, produce an impression on the photographic plate. This conjecture has been fully confirmed by Prof. Rood, who, in a series of ingenious experiments, proved that electric discharges, entirely invisible to the observer in the presence of daylight, might, nevertheless, produce images of themselves in a picture of the adjacent objects taken at the same time, the photographic plate being relatively more sensitive to these impressions than the human eye. The author describes at length his mode of experimenting; but, without a reproduction of the wood-cuts illustrating his paper, it is not possible to enter more into the details of this subject.

Death of an Eminent Chemist.

F. T. Otto, Professor of Chemistry at the Polytechnic School of Brunswick, died on the 13th of January, after a long and painful illness. He was born in Saxony, in 1809, and had resided many years in Brunswick.

Professor Otto was famous for his edition of "Graham's Elements of Chemistry." At first he made a translation of Graham's book, but with each edition introduced so many changes that the last edition may be regarded as an entirely new work. There are few books so useful to the student in the laboratory as Otto's Chemistry, in the last edition of which he was assisted by Buff, Kopp, Zamminer, Kolbe, and Fehling, the best lights of chemistry in Germany. Otto also published books on poisons, on vinegar, and on agricultural industry, which are highly prized.

An Ingenious Lunatic.

The *Pall Mall Gazette* tells the following "steep" story of a lunatic who recently escaped from an asylum in Ireland, and who was noted for his mechanical ingenuity: "He could do things quite beyond what men in general can perform, and his cleverness was even exceeded by his versatility. He was a good shoemaker, a tailor, a weaver. He made from a scrap of iron a key by which he could open the door of his division. He put together a wooden sewing machine of his own contrivance, with which he made clothes for himself; and his mind just before his escape seemed so intent on improving this machine that there was little apprehension of his attempting to escape. His career, it is stated, before he came to the asylum was most extraordinary. He had been in the British army, in the French army, in the French navy, and had been in British, German, and Russian prisons. He had a fair grammatical knowledge of French, he knew something of German, and was completely self-taught; his age, although he had passed the various phases of existence above described, was only twenty-seven."

TELEGRAPHIC communication with India is now so far perfect that electricity now outstrips the course of the sun, as it frequently happens that messages transmitted from Calcutta at noon to London are delivered by the Indo-European Telegraph Company at 10.30 A. M. The communication between London and Teheran (the terminus of the Indian Government lines) is actually instantaneous.

Electricity Applied to Mechanical Purposes.

An inventor has recently produced a small engine which works entirely by electricity, the current being supplied by a continuous battery. A few lathes and planing machines are now run by a small power of this description.

Such an invention, if it actually works on a large as well as on a small experimental scale, would have an immense advantage over steam, which it would entirely supersede.

An engine several hundred horse-power would not occupy more than a few cubic feet of space, and on board vessels this would be all gain, as the space now used for coal and engine room could be filled up with paying cargo.

We are informed that a machine large enough to propel the greatest steamer afloat is being made in New York. —*Scientific Journal.*

The Watchmaker and Jeweler.

The May number of the *Watchmaker and Jeweler* has been enlarged to thirty-two pages. Nine months since this publication made its appearance one half its present size. The watchmakers, jewelers, silversmiths, and opticians adopted this paper as their organ; this accounts for its success. The numerous subjects treated by this paper makes it valuable to every one interested in the above trades. Among the contents we notice "Reed's Treatise on Watchmaking," "Denison on Clocks, Watches, and Bells," "The Microscope—its Construction and Use," "The Construction and Use of the Achromatic Telescope," and a number of other subjects of interest to every one interested in scientific matters. The articles treated are suitably illustrated. Published monthly by E. Albert & Co., 65 Nassau street, New York, at $2 per annum, payable in advance.

Past, Present, and Future.

You cannot overstate our debt to the past; but the moment has the supreme claim. The past is for us; but the sole terms on which it can become ours are its subordination to the present. Only an inventor knows how to borrow, and every man is or should be an inventor. We must not tamper with the organic motion of the soul. 'Tis certain that thought has its own proper motion, and the hints which flash from it, the words overheard at unawares by the free mind, are trustworthy and fertile when obeyed, and not perverted to low and selfish account. This vast memory is only raw material. The divine gift is ever the instant life which receives and uses and creates, and can well bury the old in the omnipotency with which nature decomposes all her harvest for recomposition. —*Ralph Waldo Emerson.*

New Source of Quicksilver.

A layer of quicksilver ore has been recently discovered in the district of Sarawak, Borneo, which ore promises to be one of the richest in the world. A trial of a large quantity of this ore has been made, and proved to yield from 70 to 80 per cent. of metal; this ore is, therefore, very nearly pure sulphide of mercury, and is of very rare occurrence, since the average of mercury ores yet known do not contain more than from 2 to 20 per cent. of metal. Borneo is rich in minerals of all sorts, and the ores found there are of exceedingly good quality.

Inebriation Hereditary.

Dr. Turner, in his "Second Annual Report of the State Inebriate Asylum," states that out of 1,406 cases of delirium tremens which have come under his observation, 980 had an inebriate parent or grandparent, or both. He believes if the history of each patient's ancestors were known, it would be found that eight out of ten of them were free users of alcoholic drinks. —*Med. Record.*

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

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145 Broadway, New York.

NEW YORK, MAY 15, 1870.

THE SOUTHERN WIRES.

There are few men officially connected with the telegraph service who devote more persistent care to their duties than Mr. J. W. Kates of Lynchburg, Va. He is Superintendent of a large and important District (adjoining those of two veterans in the service, Messrs. Dowell of Richmond, Va., and Brenner of Augusta, Ga.), over which he watches with most heroic care and jealousy. In a private letter to a friend, and which is now in our hands, we gather some interesting statements of the result of the reconstruction of the Southern wires under Mr. Kato's supervision, which, for aught we know, may be an augury of the coming advancement of the entire Southern society and commerce.

In a recent test of the Southern wires at Washington—by the use of a fine English galvanometer supplied a year or two ago by Mr. Varley—in the presence of Gen. T. T. Eckert, Mr. Van Horne, the General Superintendent of the Southern Division, and Mr. Buell, the following results were shown :

No.		Miles.	Mileage resistance. Insulation in Ohms.
5	R. R. Wire......	177	2,301,000
6	Wash. and Richmond..	160	1,767,600
7	N. York and N. Orleans	177	8,389,800
7	Wash. and N. Orleans.	177	7,434,000

These wires were tested after 24 hours rain. The English standard of resistance for bad weather is 1,000,000 ohms. All of these wires, therefore, were largely above the English standard, the New York and New Orleans wires being respectively 7.4 and 8.3 times better. These wires are regarded as equal to any in the United States, and the test is demonstrative of very great excellence.

To some non-experts who read this, the use of terms and the multiplicity of figures in stating the results shown will be confusing. How shall we make it plain? We will try. Many eyes who read this paper need the explanation.

1. An insulator of "high resistance" denotes its capacity to insulate. Its resistance means that it is so perfect an insulator that the current of the wire cannot escape by it. The poorer the insulation, therefore the less resistance.

2. A wire of "high resistance" denotes one of two things: either it is a bad conductor, or it is badly jointed. Great length or diminished size, also, will exhibit a proportionately high resistance. The lower the resistance the better the wire.

3. There are standards of excellence to which the condition of a wire or insulator is referable, by which to ascertain the value of either, and by which, especially in Europe, and now more generally in America than heretofore, both are tested.

4. Now, suppose an instrument made, i. e., a galvanometer, which, by being placed in the circuit of a wire of standard excellence, points by its indicating hand to 100. If a wire, connected with the same machine, causes the pointer to turn to 125, 150, or 200, these figures will show its comparative inferiority. The wire is either bad, or there is a joint in it not perfect.

5. So with insulation. The galvanometer is applied to a very carefully made insulator, designed as a standard. The pointer is at 100. Now, if another insulator is put under the like test, and the pointer turns to 125, 150, or 200, these figures demonstrate the superiority of the latter. When, therefore, a wire of small resistance and an insulator of great resistance are employed upon a line, the highest excellence is secured.

Now, this is what is shown on these two New Orleans wires. The English standard of excellence is 1,000,000. These two wires show an insulating resistance eight times better, or about 8,000,000. The croakers about the miserable condition of Western Union lines have the information gratis. Mr. Kates, be happy.

◆

THE MESSENGER SERVICE.

In the telegraph service, as in almost all others in which a variety of agencies is required, that which is unseen and apparently subordinate is as vital to full success as that which more markedly gives significance to its administration. In every department unswerving fidelity is essential, but not the least so in him who performs the final though humble duty of delivery. The messenger is as needful to the telegraph as the wire, performs a like service, and deserves a like regard. What the insensate metal does beneath the manipulating finger, the boy does with his lithe body and nimble feet. Prof. Morse did not invent him, although he is necessary to his invention, and no one who has control of a telegraph line can afford to slight him or the work he performs.

In parts of Europe, and now in England, the messenger service is beggarly. It is committed, if we are to believe all we read, to school boys or the unpaid children of poor paid postmasters. In America they are better cared for, although not a whit better than they deserve. In general they are worthy of the attention bestowed on them. Some of them, indeed, as they loiter through the streets and leave their message book against the fence while they take a turn at taw at a schoolhouse door, make a telegraph superintendent, if he catches the young scamp, feel as if he would like to make a funeral. Generally, however, these are the poor hirelings of a loose management. They are not often seen. The American messenger is lithe, active, expeditious, and money making. Three cents a message make his feet paddle sharply over the pavement, and three cents for an answer make him a good drummer. Generally, they are courteous, respectful, and bright, and in large cities some earn as high as ten dollars a week, and put half of it, or more, in bank.

A large number of telegraph messengers have risen to comparative opulence and respect. They rub against the active men of the world who are quick to discern merit. They get a chance to peer into the ways of mercantile life, and are touched with the desire to rise. To be active is a necessity; to do their duty at once, a constant demand. Thus the very seeds of success are planted, and out of them grow an active, busy race.

We ask honor to these boys. We have desired to see them simply uniformed and cleanliness of person made essential. They become, under intelligent treatment, the most valuable operators, and the most competent officers. They have ever received our most anxious and most fraternal interest. To see those we ourselves introduced to telegraphic labor leap up into earnest, large hearted, enterprising men, is, to us, glory enough.

OFFICIAL STATEMENT.

Western Union Telegraph Company.

	March, 1869.	March, 1870.
Receipts.......	$594,279 84	$587,593 00
Expenses.........	373,645 09	385,475 04
Net Profit......	$220,634 75	$202,117 96

◆

WE have referred all inquiries respecting rules to the executive officers for official reply.

◆

THE MORSE TESTIMONIAL.

Of course it is too early yet to expect returns from any of the State committees to whom were to be sent donations for the proposed testimonial to Prof. Morse, yet we believe that when the consummation is reached it will be a source of deep regret to every man who has refrained from participation therein. There are already indications of an enthusiasm in the matter both gratifying and encouraging. Among other proofs of this spirit is the following from the principal of the well known firm of Tillotson & Co., dealers in telegraph supplies :

No. 8 Dey St., New York, May 9, 1870.

DEAR FRIEND REID: In a recent JOURNAL I found the circular of the "Morse Testimonial Fund," and at once determined to send to you a token which would indicate my appreciation of the movement and my desire for its success. All I have I owe to the Telegraph, and the world acknowledges, as I do, its indebtedness to Prof. Morse for a system of telegraph so simple and effective as to render it an easily acquired and universal blessing. But I am restrained, and I am persuaded many others are, by the limits of your appeal. It is addressed only to the Western Union force. Is it your design to so limit it? Or may I, by virtue of my long connection with that Company, not claim a right to share in a movement which should be national? At all events, I inclose you my check for twenty-five dollars as my contribution to the memorial fund, assured that in your hands the movement must be a gratifying success. Yours sincerely,

L. G. TILLOTSON.

The donation thus sent we gladly accept. The origin of the movement was so unofficial, and our nomination as its head challenged so much delicacy, that we did not feel at liberty to address any but those to whom we habitually speak through the JOURNAL. We acknowledge the propriety of its nationality, and would be glad to have it so. If the fraternity of operators of any or every line will accept us as their depository and medium,

LET IT BE NATIONAL.

It is a free will offering. We would not exclude a single soul. We would not have a boy omitted. Let every one who has fingered or seen a key, or booked or delivered a message, or set a pole, or strung a wire, or charged a battery, put his name in column if it be only for a single dime. In this there is no official pressure from any source. It is a free act. Let us see how the telegraphic heart responds to it.

The following donations have been sent to us direct :

J. D. Reid, New York	$5 00
John Horne, Jr., New York....................	1 00
R. L. Ferguson, Carmanville, N. Y	1 00
John Coyne..	1 00
George Muttart	1 00
L. C. Orvis, Manchester, Vt..........	1 00
A. J. Benjamin, Salisbury, Md..................	1 00
J. A. Hughes, messenger, Dunkirk, N. Y	1 00
John McNerny, repairer, Dunkirk, N. Y...........	1 00
Chris. Wetz, repairer, Dunkirk, N. Y..............	2 00
T. W. Niles, operator, Dunkirk, N. Y............	1 00
W. H. Smith, operator, Dunkirk, N. Y	1 00
John A. Townsend, manager, Dunkirk, N. Y.....	3 00
Charles E. Bliss, operator, Bangor, Me	5 00
F. A. H. Pillsbury, operator, Bangor, Me	5 00
Charles J. Collamore, operator, Bangor, Me.....	5 00
Ed. O. Chase, operator, Bangor, Me............	4 00

A. T. Pillsbury, operator	$3 00
David G. Stone, repairer	2 00
Frank J. Temple, messenger	1 00
Lewis H. Albrecht, messenger	1 00
J. K. Witherspoon, Camden, S. C.	1 00
"Dick," New York	1 00
C. O. Brigham, Toledo, O.	1 00
W. W. Cummings, Toledo, O.	1 00
B. Thompson, Toledo, O.	1 00
A. E. Lang, Toledo, O.	1 00
C. B. Dorr, Toledo, O.	1 00
C. S. Fisher, Toledo, O.	1 00
Geo. M. Brigham, Toledo, O.	1 00
W. W. Wells, Toledo, O.	1 00
W. A. Beach, Toledo, O.	1 00
F. M. Green, Toledo, O.	1 00
Samuel U. Parsons, Ferrysburgh, Mich.	1 50
R. T. Clinch, Supt., St. Johns, N. B.	3 00
T. M. Robinson, manager, St. Johns, N. B.	4 00
B. S. Black, operator, St. Johns, N. B.	2 00
F. W. Jones, operator, St. Johns, N. B.	2 00
G. S. Dodge, operator, St. Johns, N. B.	1 00
J. F. Edgar, operator, St. Johns, N. B.	1 00
M. Doran, operator, St. Johns, N. B.	1 00
J. J. Rankin, operator, St. Johns, N. B.	1 00
T. O. Wetmore, clerk, St. Johns, N. B.	1 00
D. C. Dawson, clerk, St. Johns, N. B.	1 00
E. B. Betts, messenger, St. Johns, N. B.	1 00
G. A. Robinson, repairer, St. Johns, N. B.	1 00
E. R. O'Brien, operator, St. Georges, N. B.	3 00
R. B. Welsh, operator, Woodstock, N. B.	1 00
E. Lorimer, operator, St. Andrews, N. B.	1 00
A. Davidson, operator, Norton, N. B.	1 00
J. J. Wallace, operator, Salisbury, N. B.	1 00
J. H. Archibald, manager, Sackville, N. B.	2 00
James Reclune, operator, Sackville, N. B.	1 00
J. Godfrey, operator, Sackville, N. B.	1 00
J. H. Frink, railroad operator, Sackville, N. B.	1 00
Premium on gold remittance above	4 95
J. G. Byrne, manager, Fredericton, N. B.	2 00
Wm. H. Hill, Superintendent Delivery, N.Y.	1 00
T. S. Garman, operator, Melville, Pa	1 50
L. L. Van Akin, operator, Lackawaxen, Pa.	1 50
William Orton, President, New York	25 00
L. G. Tillotson, dealer in telegraph supplies, N. Y.	25 00
Cambridge Livingston	10 00
R. B. Lown, operator, New York	1 00
Alex. E. Hoyt, Halifax, N. S.	1 00
A. G. McDonald, Halifax, N. S.	1 00
W. W. Wiswell, Halifax, N. S.	1 00
James J. Walker, Halifax, N. S.	1 00
James W. Laird, Halifax, N. S.	1 00
John Fitzgerald, Halifax, N. S.	1 00
Charles B. Robinson, Picton, N. S.	1 00
John W. Dennison, Wolfville, N. S.	2 00
Geo. B. Willett, Annapolis, N. S.	1 00
L. B. Archibald, Truro, N. S.	1 00
Miss H. A. Treen, Tatamagouche, N. S.	1 00
Miss P. A. Huestis, Pugwash, N. S.	1 00
W. B. Stewart, Digby, N. S.	1 00
J. W. James, Laurencetown, N. S.	1 00
A. Lawson, Yarmouth, N. S.	1 00
Mrs. E. W. Parker, New Glasgow, N. S.	1 00
Wm. Riordan, Hillsbury, N. S.	1 00
Miss R. Hadley, Port Mulgrave, N. S.	1 00
Miss E. C. Corning, Liverpool, N. S.	1 00
Z. Trott, Amherst, N. S.	1 00
Miss M. S. McGregor, Windsor, N. S.	1 00
Geo. W. Yeaton, Hantsport, N. S.	1 00
Geo. E. Lydiard, Berwick, N. S.	1 00
Miss Mary Gowan, Chester, N. S.	1 00
C. D. Jones, Weymouth, N. S.	1 00
Miss Ada A. Hurley, Bridgewater, N. S.	1 00
Miss A. Louise Rudolf, Lunenburg, N. S.	1 00
G. S. McGill, Shelburne, N. S.	1 00
X. Z. Chipman, Ragged Island	1 00
X. A. Chipman, Ragged Island	1 00
E. C. Stevens, Durand, Ill.	1 00
M. M. D., Mystic, Conn.	1 00
Premium on U. S. draft	1 70
George Gallup, Plaister Cove, N. B.	3 00
A. W. Todd, Plaister Cove, N. B.	1 00
Henry S. Hoyt, Plaister Cove, N. B.	1 00
C. E. Harris, Plaister Cove, N. B.	1 00
C. L. McArthur, Plaister Cove, N. B.	1 00
C. B. Dunham, Plaister Cove, N. B.	1 00
D. M. Sutherland, Plaister Cove, N. B.	1 00
Premium on draft	78
George Walker, Vice Pres., New York	25 00
Marshall Lefferts, engineer	10 00
W. Patterson, Muncie, Ind.	1 00

Several committees are working earnestly to secure a handsome result. We have just received the following note:

Dubuque, Iowa, May 6, 1870.

J. D. Reid, *Esq., N. Y.*

Dear Sir: The Journal of May 2 informs me of my appointment on the Ex. Com. of "The Morse Testimonial." I shall do all in my power to further the interests of the movement, and have no hesitation in saying that although Iowa is a young sister, she will make a good report of herself.

With best wishes for success in this matter, I am yours truly,
R. S. Fowler.

Durand, Ill., May 7, 1870.

James D. Reid.

Dear Sir: Accept my mite inclosed for the Morse Testimonial Fund.

"Plumb" may the pure, fair marble column rise,
His fame to trace, 'midst blue etherial skies.
High o'er "Time's Level" this bright record bear:
"He tamed the Lightnings," they his servants are.
The "Square of Virtue" will this truth indorse—
A world's benefactor, Samuel F. B. Morse!

Yours truly, E. C. Stevens, Manager.

Camden, S. C., May 2, 1870.

J. D. Reid.

Dear Sir: The suggestion of a testimonial to the grea and good Prof. Morse will no doubt find a warm response from every man in the country connected with the telegraph.

Can you call it national? It should be extended, I might say, universal. The world owes him a debt of gratitude. Wherever the telegraph extends—in Europe, Asia, Africa, and the Isles of the Sea—gratitude is felt for the great benefits conferred by Prof. Morse. The Christian, the statesman, the philanthropist, all unite in one common exclamation of thanks for the greatest benefit mortal man could bestow upon his race. Honored are the operators in being permitted to unite in bestowing (even though their means are limited) their mite in the grand undertaking. May it be such a testimonial as was never bestowed on one individual in our country before. Richly, indeed, does the venerable Morse deserve such an one.

Very respectfully,
J. R. Witherspoon, Operator.

But we have no room for more. Roll the ball on. Managers of offices are all invited to act as committees. Any sums sent to us direct will be placed in the Treasurer's hands and credited to the State.

J. D. Reid, Chairman.

◆

The example given in Rule four in the New Book of Rules in which the word "ten" is accompanied by the figures (10) is an error not observed until the books were printed. The language should simply be "at ten o'clock."

◆

We regret to have to chronicle the death of Mr. P. H. Burns, who for some time held what was called the champion key for rapid writing. We have no particulars of his death, and hope some friendly hand will send us a suitable notice of it. He was not a member of the Telegraph Mutual Insurance Association.

◆

We ask attention to the advertisement of Charles T. and J. N. Chester, N. Y., and Charles Williams, Jr., Boston, on page 149.

◆

Born.

BARLOW.—In Collinsville, May 11, to George H. Barlow, Manager W. U. Tel. Office, a son.

DANIEL.—To Leonidas Daniel, April 6, a fine daughter, fifth edition. He has his dollar ready for the "testimonial."

LUDWIG.—To E. F. Ludwig, Brooklyn, N. Y., April 22, a son.

ORRELL.—May 7, to J. M. Orrell, Bloomington, Indiana, a daughter.

SMITH.—To Gerritt Smith, Astoria, L. I., April 29, a son.

◆

Married.

KNAPP—KEARNEY.—At Newark, N. J., on the 11th instant, by the Rev. Dr. Chadwick, John H. Knapp to Miss Susie L. Kearney, both of the above place.

Mr Knapp is clerk at the New York Stock Exchange Office, W. Union Tel. Co.

◆

Died.

CARTER.—In Orleans, Ind., April 12, of inflammation of the bowels, Genevra, infant daughter of John D. Carter, aged 8 days.

GROSS.—In Philadelphia, May ——, of typhoid fever, Henry D. Gross, Delivery Clerk W. Union Tel. Office, Philadelphia, Pa. aged 29 years.

TARIFF BUREAU.

Semi-Monthly. Circular.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
May 15, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since May 1, the date of the last tariff order. Please note them in your tariff book:

NEW OFFICES.

Arrapahoe, Col., tariff 180 more than Lawrence, Kansas.
468. Bremond, Tex.
202. Bremen, O.
347. Bath, Ill.
368. Blandinsville, Ill.
410. Brush Creek, Mo.
359. Blackwell, Mo.
10. Carmel, Me.
First View, Col., tariff 180 more than Lawrence, Ks.
466. Garnett, Ks.
Grinnell, Ks., tariff 155 more than Lawrence, Ks.
*Jamestown, Lebanon Co. Pa.
230. Linden, Mich.
348. Medora, Ill.
*Oak Cliff, N. J.
Park's Fort, Ks., tariff 135 more than Lawrence, Ks.
348. Piasa, Ill.
Point du Chene, N. B., re-opened; tariff same as heretofore.
131. Sloans, O.
387. Shellsburg, Iowa.
396. Vinton, Iowa.
27. Wings Road, N. H.
323. York, Ala., reopened.

NEW OFFICES ON OTHER LINES.

	Tariff for other Lines.	*Leaves this Line.*
Jamestown, Lebanon Co., Pa.	36 3	Phila. or Harrisburg, Pa.
Oak Cliff, N. J.	Same as Hudson City, N. J.	
Bells Corners, Ont.	Same as Ottawa, Ont.	

OFFICES CLOSED.

Laclede, Mo.; Girard, La.; Locust Junction, Pa.; Eagle Tail, Ks., and Bedford, N. Y. Business for Bedford, N. Y., may be taken and sent and checked to White Plains, N. Y., at which office it will be mailed.

GENERAL INFORMATION.

The following changes in names of offices have been made:

Lime Kiln, Ala.,	changed to	Catera, Ala.
Brenton, Ill.,	"	Piper City, Ill.
Glascoe, Ill.,	"	Glasford, Ill.
Clarksville, Ill.,	"	Sciota, Ill.
Red Hot, Pa.,	"	Personsville, Pa.
Little Piney, Mo.,	"	Jerome, Mo.
Coffee Creek, Ind.,	"	Chesterton, Ind.
Craig's Mills, Me.,	"	Oxford, Me.
Sheridan, Ks.,	"	Phil Sheridan, Ks.

Rockbridge Baths, in last Journal, is in Virginia.

There is no office at Missouri River, Mo.

Business for East Albany, N. Y., will hereafter be checked to Albany, N. Y.

Offices in Districts E and F will hereafter send business for New Haven, N. Y., via Oswego; N. Y., tariff 20 and 1 from Oswego.

Offices sending business for Mexico, New Haven, Pulaski, and Sand Hill, N. Y., via Oswego, will hereafter collect 20 and 1 for other lines, instead of 25 and 1 as formerly.

Offices in Districts M and O will hereafter collect 70 and 4 for other lines from Detroit to the following points in Canada. Offices in Pacific Division will collect 60 and 3 from Detroit to the same:

Arthabaska,	Que.	Pierreville,	Que.
Acton,	"	Point Levi,	"
Batiscan,	"	Port Neuf,	"
Becancour,	"	Quebec,	"
Black River,	"	Riviere-du-loupe-en-haut,	"
Craigs Roads,	"	River David,	"
Danville,	"	Somerset,	"
Doucet's Landing,	"	Sorel,	"
Etchemin,	"	St. Anne de la Parade,	"
Hadlow Cove,	"	St. Charles,	"
Levis,	"	St. Ours,	"
Methot's Mills,	"	Stanfold,	"
Mill Cove,	"	Warwick,	"
New Liverpool,	"	Yamaska,	"
Nicolet,	"		

ATLANTIC CABLE BUSINESS.

We are notified by Atlantic Cable Company that "initials before names must be counted as separate words."

WILLIAM ORTON, President.

◆

Half rate messages will be taken for offices on the Evansville and Vincennes line, viz: Evansville, Fort Branch, Hazleton, Mount Vernon, Patoka, Princeton, Ind., and Henderson, Ky.

Telegraphers' Mutual Life Insurance Association.

ASSESSMENT NO. 12.

W. H. Bancroft,
R. S. Beckwith,
P. Diegan,
G. W. Moore,
John Fottrell,
W. H. Weller,
J. H. Cade,
A. W. Haygood,
D. H. Fitch,
J. C. Smith,
G. E. Spellman,
R. G. Fox,
C. W. Hammond,
C. McLaughlin,
R. B. Welch,
C. Dwyer,
W. C. Buell,
J. J. Harrigan,
F. D. Adams,
W. H. Ashby,
C. E. Barto,
J. V. Ford,
A. J. Locke,
F. J. Nicholson,
B. F. Follett,
John Kane,
A. R. Phillips,
C. S. Follett,
A. P. Crissey,
Geo. W. Lee,
Samuel Dunlap,
E. A. Keene, Jr.,
P. J. Casey,
John J. Heenan,
Thomas F. Heenan,
James R. Heenan,
James W. Smith,
Louis Maury,
A. S. Howe,
W. D. Mace,
Wm. Roche,
D. J. Willis,
Sam. Dunlap,
Samuel J. Smith, Jr.,
B. F. Ford,
Thomas Allen,
H. L. Gramzow,
O. K. Walcott,
John Fuller,
A. J. Stoddard,
C. A. Leib,
H. A. Tuttle,
T. W. Russell,
C. C. Scott,
A. F. Childs,
C. D. Sprague,
M. H. Redding,
J. S. Fitch,
E. K. Wilson,
J. S. Hunter,
M. W. Wilder,
R. B. Lown,
G. M. Simmons,
J. L. Edwards,
W. H. Chivvis,
J. P. Fowler,
P. H. Shaughness,
M. H. Bacon,
C. H. Vogel,
Zebina Hubbard,
W. E. Dulin,
William Arnoux,
John B. Van Every,
Charles A. Schuster,
M. O. Bagley,
Charles Beardsley,
J. Herrick,
J. C. Gregg,
W. E. Seward,
W. Frazer,
James Farrell,
J. J. Calahan,
J. P. Cassidy,
Ira Dewitt,
W. Ferguson,
J. T. Heenan,
J. W. Crouse,
A. S. Farwell,
James Hough,
Chalmers Brown,
W. S. Thompson,
C. E. Clark,
Andrew Clark,
J. M. Forster,
P. A. Smith,
Walter Miller,
John C. Henry,
M. H. Kerner,
W. A. Booth,
C. A. Bolton,
John W. Lewis,
J. A. Mantor,
P. H. Cooke,
C. M. Knox,
G. G. Hadley,
M. D. O'Connor,

◆

WE direct attention to the card of Charles Williams, Jr., on another page. The Leclanche battery has been fully described by us, and needs no new explanation. It is economic and vigorous, and, for some uses, unequaled.

◆

THE notices in various papers respecting the testimonial to Prof. Morse are amusing enough. One asserts that a Morse instrument of pure gold set with diamonds is to be presented to him on his *eighty-fifth birthday! i. e.*, in the year A. D. 1876! That won't do. We cannot wait so long. The nature of the memorial is not determined.

◆

WE have just witnessed the operation of a telegraph printing instrument for stock reporting purposes, the invention of Geo. M. Phelps, the able Superintendent of the Western Union Company's machine works in New York. It is exceedingly simple, efficient, and unique. By the use of two wires, an operator has perfect control of all the machinery in the circuit, and the motion is rapid and true. So simple is it that a non-expert present, without having previously manipulated the machine, at once sent a message by it, without error.

◆

THE history of man is but a ripple in the infinite ocean of time.

THE SERVICE.

March—Eastern District.

APPOINTMENTS.

J. J. Bates	145 Broadway, N. Y.
J. P. Cassidy	145 Broadway, N. Y.
J. Eagan	145 Broadway, N. Y.
Miss L. C. Nourse	145 Broadway, N. Y.
A. B. Davidson	Dorchester, N. S.
A. W. Springate	St. Stephens, N. B.
W. B. Barclay	Westfield, N. B.
M. Burpee	Fredericton Junc.
Jas. Edgar	St. John, N. B.
A. S. True	Haverhill, Mass.
F. S. Stone	Glens Falls, N. Y.
J. B. Hoyt	Grafton, N. H.
Clara S. Crocker	Chelsea, Mass.
Miss B. A. Thompson	Holliston, Mass.
E. F. Beals	Milford, Mass.
Geo. Howe	South Braintree, Mass.
H. C. Crandall	W. Cornwall, Conn.
Miss M. J. Coombs	Russell, Mass.
Miss M. A. Gay	B. & P. Depot, Boston.
Geo. A. Lance	Albany, N. Y.
Robert P. Brooks	Amenia, N. Y.
James Best	Millerton, N. Y.
H. Smith	Fordham, N. Y.
Miss K. Canon	New Hamburgh, N. Y.
Ormiee Coats	Utica, N. Y.
Miss Bella Best	Baltimore, Md.
A. G. McKee	Beverly, N. J.
J. R. Wallace	Nanticoke, Pa.
Zach. Nutt	Philadelphia, Pa.
E. C. Stewart	Washington, D. C.
Geo. L. Diven	Washington, D. C.
J. F. McConnell	Washington, D. C.
B. T. Johnson	Washington, D. C.

TRANSFERS.

W. S. Burley	New York to Philadelphia.
J. Trott	Dorchester, N. S. to Amherst, N. S.

LEFT THE SERVICE.

J. M. Barnard	New York.
C. A. Smith	New York.
Gilbert Morris	Amherst, N. S.
Miss R. W. Hale	Haverhill, Mass.
Geo. Marcy	Bangor, Me.
W. K. Starr	Portland, Me.
D. E. Peck	Glens Falls, N. Y.
W. R. Davis	Grafton, N. H.
Miss J. C. Orcutt	Chelsea, Mass.
L. J. Wilson	Milford, Mass.
Miss. K. A. Murphy	W. Cornwall, Conn.
Miss S. A. Brooks	B. & P. Depot, Boston.
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E. B. Blackman	Philadelphia
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D. L. Findley	Washington.
John W. Ley	Washington.

DISMISSED.

H. A. Bogardus	Washington, D. C.

DIED.

T. J. Jordan	South Braintree, Mass.

◆

The Electric Storm.

CHICAGO AND NORTH-WESTERN R. R. Co.,
BOONE STATION, April 23, 1870.

GEO. H. BLISS, *Esq., Telegraph Superintendent.*

MY DEAR SIR: Tuesday morning, March 15, it commenced snowing and blowing a perfect gale. At 8 A. M. all the lines were in more or less trouble caused by atmospheric electricity. From Tuesday morning until Thursday morning there was so much atmospheric electricity that it was impossible to work the lines on the north side of the track. We experienced very little trouble from atmospheric electricity on the south side of the track. During this time the wind and snow blew a perfect gale. I made several attempts during each day and evening to work the lines, but was unsuccessful. There was a continual snapping on my switch board, and opening and closing of the ckt. The most surprising part of it was that it was wholly confined to No. 1 and 4 on the north side of the track. Very truly,

M. M. TOWNE.

The Boys on the Isthmus.

We have before us a photograph of the telegraph camp of the surveying party at Caledonia Bay. Beneath an immense cocked hat, and within the compass of immense amounts of hair, we recognize New York Operator Clark. Four unknown aids sit or lounge before him, and none of them seem expectant of any speedy "walk down Broadway." A small specimen of the 15th Amendment is squatted in front, while leaning against a log in a mournful way is visible a square bottle, which is no doubt empty. What it once contained we cannot imagine; something, we presume, for locals! The end of a keg is also visible, by which we suppose that the party, if a dry one, has the means of lubrication.

No feasible route has yet been found for the great canal, and the whole party is now at San Blas, 125 miles south of Aspinwall, examining another route. The Darien ship canal is not yet assured. Napoleon III. indicated Nicaragua as the proper route. He is no mean engineer. It may yet be the route selected.

◆

W. W. SMITH, ESQ., Vice-President of the Cincinnati and Lafayette Railroad Company, has invented a useful and very practical mode of overcoming the obstruction of a multitude of magnets of the old size on a way line. This is done by attaching the wires of the like ends of two coils to a single binding screw, attaching the other like ends to another binding screw in such a way that the current is split, one-half going through one coil and one-half through the other. Actual experiment shows that the obstruction or resistance is reduced 75 per cent, while the power is not reduced in anything like a kindred proportion. It is a mode of reducing the size of a magnet without altering its form, and practically renders a magnet of 20 miles resistance only 5. By the use of convenient shunts, the resistance can be increased either to 10 or 20, as circumstances may render desirable.

◆

Shoo, Fly.

This ludicrous yet popular song with the masses is quite old, having been sung long before the war by the negroes of Georgia. It is well known that a fire-engine bore the name of "Shoo Fly," in Savannah, as far back as 1856, having derived its name from this simple and senseless song. As a matter of curiosity to hundreds who have had the chorus ringing in their ears on every hand for several weeks past, we give the words of what may truthfully be termed the song of the period:

SHOO, FLY! DON'T BODDER ME!

I think I hear de angels sing,
I think I hear de angels sing,
I think I hear de angels sing—
De angels now are on de wing.
I feel, I feel, I feel—
Dat's what my modder said—
De angels pouring 'lasses down
Upon dis nigger's head.
CHORUS—Shoo, fly! don't bodder me!
Shoo, fly! don't bodder me!
Shoo, fly! don't bodder me!
I belong to Comp'ny G.

I feel, I feel, I feel,
I feel like a morning star;
I feel, I feel, I feel,
I feel like a morning star;
I feel, I feel, I feel,
I feel like a morning star;
I feel, I feel, I feel,
I feel like a morning star.
If I sleep in de sun, dis nigger knows,
If I sleep in de sun, dis nigger knows,
If I sleep in de sun, dis nigger knows,
A fly come sting him on de nose.
I feel, I feel, I feel—
Dat's what my modder said—
Whenever dis nigger goes to sleep
He must cober up his head.
CHORUS—Shoo, fly! don't bodder me! etc.

Journal of the Telegraph.

Mr. S. F. McKay, operator, Newport, Maine, although minus an arm, has been appointed ticket agent of the Maine Central Railroad. He does not give up the key. His one arm seems to be as good as two to many others. He appears to be highly respected.

* * *

Samuel Rice, operator W. U. Tel. office, Wilkesbarre, Pa., sent recently 1,600 words press matter in 33 minutes. He asserts his ability to send 3,000 words per hour.

* * *

The Senate demur to the proposed appropriation of land for the benefit of the Pacific Cable.

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We have therefore made arrangements not only to secure the EXCLUSIVE AGENCY for its sale, for the purposes for which we have already sold it so largely, but to furnish complete

IRON-CLAD CABLES

of the usual size with Kenite Covers, believing that it will exceed in insulation for submarine purposes anything hitherto manufactured.

We shall be happy to furnish estimates for any amount and size of Cable which will be found to compete with any other construction, both in quality and price.

In corroboration of our statements we append extracts from reports of those who have exposed it to the severest practical tests :

FROM PROF. SILLIMAN, OF YALE COLLEGE.

"I am satisfied, as the result of my own researches, that Ozone is by far the most fatal of atmospheric influences. I have submitted portions of Kenite to the action of a highly ozonized air for a sufficient length of time to prove them, and at the same time have exposed the best English Gutta Percha Covered Cable to the same tests with the following result : After long exposure, Kenite resists perfectly : The best English Gutta Percha Cable was speedily destroyed. A few days' exposure to Ozone would produce more effect than many years in a normal atmosphere exposed to Carbonic Dysulphide, Nitric Acid, Sulphuric Acid, Sulphuric Dioxide, Nitric per Oxide Chlorine Gas, and Alkaline Hydrates. Gutta Percha is immediately dissolved in Carbonic Disulphide, and powerfully acted on by Alkaline Hydrates. Some samples of Kenite resist the action of the former in a surprising manner, and are completely unaffected by the latter."

FROM MOSES G. FARMER OF SALEM, MASSACHUSETTS.

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"It is a well known fact that Gutta Percha deteriorates very rapidly when exposed to atmospheric agencies, and therefore cannot be advantageously used for the covering wire for outdoor exposure, unless buried in permanent moisture."

FROM MR. E. A. CALLAHAN, SUPERINTENDENT GOLD AND STOCK TELEGRAPH CO.

"It has under all circumstances given us the fullest satisfaction. The peculiar nature of our business renders it necessary for us to use the most perfectly insulated wire. I have tried several kinds of insulated wire, but have been compelled to take all down and substitute Kenite instead. Wire strung a year since is as good as the first day put up ; have tested it after three days constant rain, and could not find one degree of escape. We use it in gas pipes, and sometimes placed near furnaces subject to very high temperature. I have not been able to detect the slightest change from its original condition. We have exposed it to the extreme cold and heat of the past year strung over the roof of buildings, which we consider the best test of its indestructible and insulating qualities.

McKEE'S RAILROAD SIGNAL BOX.

All Signals connected with the Railroad service should be uniform, conspicuous, and ready to display at a moment's notice. Under the present system when an operator receives an order to detain a train, he has to take his flag, hunt a suitable place to stick it up, and keep runnin; out every minute until the expected train arrives, to see that his flag or lantern don't get misplaced, or the view obstructed. More accidents occur from the proper signals not being shown than by any neglect on the part of operator or trainmen. The importance of having those Signals placed in a conspicuous position cannot be overestimated ; it is the basis of all train dispatching by telegraph. This long needed improvement has been supplied in

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Gen'l Sup't C. B. & Q. R. R.,

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is now in operation in the following cities, to which reference is made for evidence of its great SUPERIORITY AND VALUE, and UNIFORM reliability:

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PITTSBURG,
LOUISVILLE,
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MONTREAL,
QUEBEC,
PORTLAND,
ST. JOHN, N. B.,
HARTFORD,
TROY,
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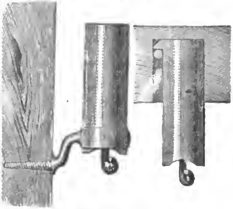

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It is not injured by missiles in the general acceptance of the term.

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It is not injured by atmospheric discharges. It is a protection to the poles from the same effects, there not being an authenticated instance of a pole being injured where these insulators are used.

John Polhemus, Printer and Stationer, 102 Nassau Street, N.

JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 13. NEW YORK, JUNE 1, 1870. WHOLE NO. 62.

EDWARD CREIGHTON.

The Telegraph in America has not been extended to its present proportions without a multitude of agencies, all apparently so interlocked as to have made each one dependent on every other. There were men who, by forecasting its vast benefits to society, stimulated capital. At first this was no easy process. To men who had amassed fortunes by building railroads, and giving commerce wings upon the ocean by a steam marine; to men who accreted their millions by discounting notes, by trading in stocks, by dealing in the great staples which all needed and every one must buy, the proposal to string wires through the air to convey language from city to city with the speed of thought was too visionary to enlist consideration. The most thoughtful and the most practical men laughed at it. When John Butterfield and Theodore S. Faxton represented to the officers of the New York Central Railroad its usefulness in regulating trains, they were regarded as candidates for an institution in their native city of Utica whose massive columns and long wards welcomed and confined, and cured, the visionary and the insane. The first money subscribed for the construction of telegraph lines was given partly to encourage a scientific idea, partly as a gift, and partly by the enthusiasm of a few practical men who bent themselves to its successful introduction. Now, almost any sharper can get up a capital for a line of telegraph. The art of enlarging upon its possibilities and its capacity to earn golden results has been thoroughly acquired. It is the age of *morus multicaulis* revived, when from each budding spot which pimpled on the tiny branch whole jungles of coming trees seemed to grow, and on which myriads of silkworms were yet to weave their rich cocoons in the glowing and golden light of the summer's sun.

Engraved by J. L. Langridge.

Then came to light a class of men who, taking advantage of the awakened attention of the people, went through the country organizing companies to connect special localities to each other. Poles were cheap and easily got, and a margin of one or two hundred per cent. made hungry men keen to complete the aerial roads. Poles of any size, from a fishing rod to a bean pole or a rail fence, so that they could be bought under fifty cents a piece, went up along the farm sides like magic, and all outside infidelity to permanence was forgiven when the corresponding click of the wondrous machinery was heard and Clockville was announced as connected by magnetic Telegraph with Slab City.

After this came a class of men who saw that this fragmentary and temporary provision for what was making itself manifest as a great public necessity must soon prove its folly and its weakness. Already commerce had seen the advantages of speedy communication with her interests at points far remote from each other, which so far could only be maintained by the use of a multiplicity of lines which turned over their poorly executed work from one to the other, each charging its separate tariff, and by frequent rewriting consuming time and multiplying error. These men commenced grouping these fractional lines, extending the territory of single jurisdiction, reducing the process of repetition, and opening up to commerce the possibility of communication so speedy and so correct as to make it the basis of new schemes of enterprise, which it was not slow to use, and which not only enlarged the sphere and scope of commerce but, by the perception of that possibility and the free use of the wires to which it led, brought fortune and success to these sagacious focalizers of the telegraph in America. Thus Hiram Sibley and J. H. Wade, and Ezra Cornell, as well as others, enjoy to-day their well earned fortunes.

But to these men there were needed practical men to carry out fully their projects. It was not alone necessary to amalgamate the various lines in one; almost all of these amalgamated structures had to be rebuilt and made permanent. Uncertainty of communication was no longer even tolerable. So men who could be relied on to change these ephemeral structures and make them enduring, as well as to pioneer new routes, were essential. Prominent among these was the subject of the present sketch, a man who by simple, practical common sense, by devotion to the labor he undertook, by freedom from all fanciful conceits, by fidelity in carrying out his contracts, has placed himself, as to wealth and influence, on a level with those who at first attached him to their service.

Edward Creighton was born in Belmont County, Ohio, near the present town of Barnesville, August 31, 1820. In 1834 his family removed to Licking County, near Newark, O. In 1840 he went to Springfield, where he secured a contract in the construction of a part of the national stage road between Springfield, O., and Wheeling, Va.

In 1815 he entered into a contract to prepare the roadbed of a portion of the Little Miami Railroad, which he executed to the satisfaction of the Company.

In 1847 Mr. Creighton commenced his first telegraphic work by supplying the poles between Springfield and Cincinnati for the Pittsburgh, Cincinnati and Louisville Telegraph line then building under the superintendence of Capt. John O'Reilly. He also provided the poles for the line from Cincinnati to Louisville, Ky.; had them all on the ground ready for the army of constructors who rushed westward at the rate of six to ten miles per day. After this he went to St. Louis and provided the poles for the line north from St. Louis via Alton, Ill.

In 1848 Mr. Creighton was sent south by Henry O'Reilly to build the part of what was known as the People's Telegraph Line from New Orleans, La., to Aberdeen, Miss. The poles for this work were of red cypress, chiefly obtained from the Red River. In the same year he built the Ohio and Indiana line from Cincinnati to Dayton, and from Lafayette to Evansville. The following lines he built in quick succession:

1849.—The Telegraph line from Cincinnati to Sandusky, Ohio.

1850.—Rebuilt a large portion of the Pittsburgh and Louisville Telegraph line.

1851.—Built the House State Printing Telegraph line (New York to Buffalo) and the lines of the Mississippi Valley Printing Telegraph Company from Buffalo to Louisville, Ky.

1852.—Built the lines from Cleveland to Chicago, Ill.

From that period until 1859 Mr. Creighton became the general agent of the lines then organized as the Western Union Telegraph Company, laying cables across all the principal streams, and generally surveying and pioneering their enterprises.

In 1859 he was directed to examine the route via Fort Smith toward California, and reported against it. Another route from Memphis, examined by him as far west as Colorado, he also reported adversely. In the winter of 1860, however, he surveyed the route from Omaha to California via Salt Lake, starting from Omaha November 18, 1860, traveling to Placerville and Sacramento on a mule, returning to New York April 12, 1861, with a favorable report of the route.

The whole scheme of a line of telegraph from ocean to ocean was therefore based on Mr. Creighton's report after a personal inspection, and the expression of his willingness to undertake its construction.

In 1861 the great Pacific Telegraph line was commenced. It was started on the 4th day of July, and was completed and communication established on the 24th day of October of the same year, a specimen of vigor and rapidity of labor not often surpassed. Of the great work which has ever since been maintained with marvelous constancy and success, the party under Mr. Creighton constructed 700 miles west of Omaha via Julesburg, connecting with a party under W. H. Stebbins who built 400 miles of the line from Salt Lake eastward. The line from San Francisco to Fort Churchill, Nevada, which had already been built by the California State Telegraph Company, was pushed forward over the 450 intervening miles to Salt Lake City, so that the whole was completed, and the three portions of the great work connected, at the time stated. This enterprise arrested the attention of the whole world and gave immediate form to the movement, now so grandly successful, of connecting the great oceans by rail.

From this time until February 1, 1867, Mr. Creighton remained upon the lines west of Chicago as Superintendent, when, on their being made a part of the Western Union Telegraph Company's property, he resigned.

In 1864 Mr. Creighton built the line from Julesburg to Denver and Central City, Col. In 1866 he built the line from Denver to Salt Lake City, and in the same year from Salt Lake to Virginia City, Montana, completing it during the following year to Helena, and in 1869 to Fort Benton. In 1869 he built the present new line along the Union Pacific Railroad from North Platte to Monument Point, and for the Western Union Telegraph Company their line from Laramie City to Promontory, both of which were constructed in the strongest and most permanent manner, as became so important an avenue of communication.

In the work of constructing the 700 miles of telegraph across the plains vast numbers of oxen and wagons were employed, which Mr. Creighton purchased on the completion of his contract. This led him into a vast freighting business for Government and private houses, which proved highly remunerative, and which was carried on from 1861 to the opening of the Pacific Railroad with great success.

Mr. Creighton's last important contract was the grading of 40 miles of the Union Pacific Railroad, which he finished with great promptitude and satisfaction to the engineers of that great national work.

Since that time Mr. Creighton has established the Omaha National Bank, of which he is the President. He is also Director of the Colorado National Bank at Denver; also of the Rocky Mountain National Bank at Central City. He is also proprietor of a large flour mill in Council Bluffs, Iowa.

In the prosecution of all these important labors Mr. Creighton had, of course, to employ many men, and was fortunate in his selection of those who had chief direction of the various parties who accomplished the mechanical duties assigned them. To provide for these faithful men now became the ruling desire in Mr. Creighton's mind, and in the accomplishment of which he now finds his chief pleasure and satisfaction. He had secured to himself by all these enterprises a large fortune. He now entered into the purchase of cattle, intrusting his former foremen with their care and sale. He has sixteen of these men in charge of 10,000 head of cattle, 6,000 of which are on the plains around Laramie, and 4,000 elsewhere in that region. These men have a half interest in these cattle and receive half of the profits in their sale. They have already driven 2,100 head to San Francisco, selling them at remunerative prices. Some of these men are now worth $50,000, and are building up a society in that region which will greatly accelerate the development of the country. Mr. Creighton supplies all the capital needed, meets them frequently for consultation, and aids in their projects for means of education and improvement. He thus not only enjoys the acquisition of a large fortune accreted by actual labor, but the satisfaction of seeing those who have toiled for him entering into and enjoying a like success.

Mr. Creighton has now on the plains 150 fine horses, and is collecting together a herd of 10,000 sheep to be tended by the same men who shepherd the other cattle, thus making himself the largest cattle dealer in the United States. All this is done without any necessity of his personal labor, and thus, by the judicious and generous care for the future of others, he is constantly adding largely to his own wealth.

Of course all these labors and successes have brought with them not only wealth, but influence; yet we do not observe, in our frequent contact with the subject of them, any change in manner or any assumed superiority over the days when he bought poles for us in the Muskingum or Miami valleys 20 years ago. Mr. Creighton has learned one grand secret of life, unless his own language greatly deceives us, that true happiness after all is obtained by providing the means of happiness to others. Long may he act upon so fruitful a discovery, and make his own life as well as that of many others perennial in its abundant blossoming, and rich in its accumulating fruit.

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THE TELEGRAPH AND ITS MODERN APPLICATIONS.

BY GEORGE B. BLISS.

[The following article is one of many put aside by the pressure upon us, but which loses none of its interest by the delay:]

The utility of the telegraph in connection with railway services is rapidly becoming better appreciated. Like the printing press and the use of steam it has sprung into a position of commanding importance in spite of prejudice and every obstacle. When Prof. Morse appealed to the nation for assistance in the construction of an experimental line, and to the public for support, he was met with ridicule and prediction of failure from many learned heads, whose prophetic foresight has since been proven thoroughly visionary. When a superintendent on the Erie Railway first attempted to suspend a time-card rule and run a train by telegraph, the conductor absolutely refused to obey, mistrusting the sanity of his superior and the correctness of the dispatch. This lack of confidence has given way to an implicit reliance, extending into the most detailed management. The telegraph has become the nerve, bringing intelligence to the brain power that moves the road, warning of danger, retrieving disaster, and causing all things to move forward with harmony and purpose. It has rendered possible the manipulation of the large railway corporations of the country, bringing within the iron grasp of a single mind the utmost minutiæ from points a thousand miles distant with more certainty and exactness than under the old system could be done on a single hundred miles of road. By it, engines and cars are made available to their fullest extent. Take a case where some train having a right to the track is delayed, and its detention holds others in check. The train dispatcher is master of the situation, and, having full knowledge of the circumstances, will move each train from station to station, arranging new places of meeting so that the least possible time is lost, and with as much freedom as a chess-player can pass his piece from square to square on his board. Notwithstanding this manifest benefit, there are prominent roads which only within a few months have made any attempt to secure the advantages within their reach, in this direction. In busy seasons, when cars are worth from fifty to one hundred and fifty dollars per day, immense trains of empty freight cars leave Chicago daily, the destination of not a single car being known; but while in transit, by means of the telegraph these are distributed to the points where the demand is most pressing. A just estimate of the saving effected in this matter would astonish many who have never given the subject the thought it deserves.

If a bridge is carried away, before it fairly leaves the abutment your civil engineer is telegraphing his specifications to half-a-dozen shops, and by the time the loss would be known formerly trains are hastening with completed material for the new structure. The management of the passenger and freight business in all matters requiring speed, and, in fact, the concentration of effort at the right time and place in all departments, depend equally on the telegraph. In such high esteem is the telegraph held by some railway officials that they prefer a single track road with the telegraph to a double track without, and when the relative cost is considered, the tribute is a high one.

Such being some of the benefits of an efficient telegraph system, how important it is that every railway company should possess the best that a reasonable outlay will obtain. The attempts in this direction have, many of them, fallen far short of the desired end. Some have failed from an error of organization, some from puerile economy, and some from gross ignorance. Electricity is the most subtle of agencies, governed by laws which must be closely studied, and tested by experience in order to be mastered. It is not strange, when lines are placed under control of persons having only a surface knowledge, or in the hands of those whose other duties usurp the larger portion of their attention, that they fail to give satisfactory service. It cannot be expected that wires will work well when constructed in violation of the principle that the means must be adapted to the desired end. When companies invest fifty thousand dollars in a fancy engine and thirty thousand in a directors' car, and deny the few thousand necessary to equip their roads with first-class telegraph facilities, their wisdom may justly be considered questionable.

I appeal to the fraternity if it is not absurd that a severe rain should render our land wires useless for distances over one hundred miles, and in many cases much less, when wires can be stretched from shore to shore beneath an ocean of moisture and worked with a battery no larger than a lady's thimble. True, the obstacles of the land lines are somewhat different, but there is nothing in their way which cannot be overcome by a judicious expenditure of money. Is it not a cause for regret, that while an American originated the first practical system of telegraphing, which is now in use on nine-tenths of the existing lines, that in scientific attainment, investigation, and adaptation we are far surpassed by the English and other Europeans. They have long used apparatus by the means of which, so to speak, electricity can be weighed, measured, and gauged, determining the relative merit and capacity of wires, instruments, and batteries, resulting in a perfection unknown among us. For the lack of this attainable knowledge, the telegraph authorities in this country have made many ludicrous and expensive blunders. A plain glass insulator was early in use, but was deemed objectionable on account of breakage. To remedy this, the Wade insulator, which was constructed by covering a modified form of glass with a tar saturated wooden cap, was introduced at more than double the cost. Many hundred miles of lines were thus insulated, when the discovery was made that the wooden caps acted as a sponge to retain moisture, the great enemy of insulation, while any concussion broke the glass, destroying all insulating power, but still leaving the insulator externally in perfect condition. The glass in many of these insulators was broken by the heat of the tar, in the process of manufacture, and they were worthless from the start. The result has been that during the last two years thousands of these insulators have been displaced, and plain glass insulators substituted, at no inconsiderable expense. A few practical and scientific tests might have demonstrated the faults of this insulator before it had ever been put into actual use. It is the European custom to test every insulator thoroughly before putting it up, and this inspection leads to the rejection of a large percentage; while we, with culpable negligence, put them into lines, indifferent as to their real condition, if externally sound.

During the past few years the telegraph community has been running wild on the subject of resistance. Relays have been manufactured having a resistance as high as one hundred and fifty miles, taking as a standard No. 9 iron wire perfectly insulated, and many more approximating this figure have been made. These enormous resistances, placed in lines without reference to the size or length of the conductor, have rendered excessive battery power necessary and caused the current to escape wherever the insulation showed the slightest defect. It is now conceded that thirty miles is a maximum resistance for a relay, and that on many wires a much lighter resistance is sufficient.

Little attention has been paid to the size and quality of conductors. To force a current of electricity over a small wire is like trying to compel a large stream of water to pass through an inadequate pipe. What an eighty pound rail is to a sixty pound, a No. 7 is to a No. 9 conductor. A No. 9 galvanized wire is in common use here, though a few companies, like the Chicago, Burlington & Quincy, are using a No. 7. This does not equal many of the foreign lines, where No. 4 is used for long wires, after being subjected to the severest tests. One of the most simple tests is to make an ordinary connection, then disconnect, and again connect, twisting it in the opposite direction to the first splice. Probably not one-tenth of our wire would stand such a trial. The three great requisites of a good telegraph line are strength, conductivity, and insulation. No material ought to be used but the best, and great care should be taken in proportioning it.

The idea has been suggested that something could be gained by substituting a twenty foot pole with cross-arms for the twenty-five foot pole with bracket insulators. By spreading the wire on cross-arms they could be raised to the same average height, and the leverage upon the pole by winds and sleet greatly diminished, while there would be less liability to crosses than with the wires near the pole and directly under each other. The upper surface of every cross-arm should be beveled.

The character of a conductor depends largely upon its size and quality, so that the questions of strength and conductivity are closely linked together. Any improvement in one favorably influences the other. The most perfect insulator is always the one to buy, no matter what it costs. A line may be strong as adamant and a thoroughly good conductor, but if the insulation is defective it will not be serviceable. Happily, in the recent discovery of parafine—the best known insulating substance—the combination of copper and steel for a conductor, the introduction of delicate testing apparatus, and the awakened interest in telegraph circles upon the more advanced problems of the profession, a new dawn is breaking upon telegraphy in this country. The invention of the system of double transmission, by which messages can be sent in both directions at the same time on the same wire, will largely increase the capacity of lines, and is significant of the era of cheaper telegraphing.

If the American people ever commit themselves to the folly of presuming that a government monopoly, under the name of a Postal Telegraph, can transact the business to better advantage than competing private enterprises, no success will be obtained without the co-operation of railroads. A free and independent telegraph line is a necessity to every road, which can maintain it cheaper and better than any other party. By contracts with railways, based upon the mail service plan, the local business could be done and through wires provided for by rental, so that the Government would be obliged to invest only the comparatively insignificant amount needed for city wires. It is nonsense to say that the Government could not command the best telegraph talent of the country, and a slur upon our institutions to believe that such a department could not be managed with a degree of honesty commensurate with that of the community at large.

The application of electricity to dial instruments suitable for the use of business firms on short lines, to hotel annunciators, to fire and burglar alarms for dwellings and cities, to illuminating and medical purposes, and to electric brakes, all testify to the merits of this agency, which pervades every animate and inanimate thing.

I cannot close without calling attention to the telegraph lines recently constructed in Chicago, which are the pride of every telegrapher, and ought to be of every citizen. The size of the poles, the use of Brooks' parafine insulator, the character of the work and general plan, are worthy of the highest commendation. It may be questioned whether anything has been gained in strength and symmetry by putting the largest arm at the top, and thus reversing Nature's method of growing a tree; but until our wires shall be introduced into the city under ground, these lines will stand and hold a first rank among the city lines of the nation.

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THE telegraphic line between Valparaiso and Buenos Ayres, across the Andes, will soon be erected. Messrs. Clark & Co. of Valparaiso have succeeded in arranging this most important enterprise. The first portion of the line is now being shipped in London for Rosario. As the Panama, West India, and Pacific line will be extended to Peru, this will be united with the Transandine line from Valparaiso, and as the Argentina and Brazilian Governments have granted a concession for another cable to be laid from the coast of Brazil to the West Indies, there will be in a short time a direct communication with the whole of South America by two lines. The telegraph between Valparaiso and Buenos Ayres will be constructed entirely with iron poles, and the best materials that can be obtained in England. The Argentine Government has granted a subsidy to this telegraph company of $30,000 a year, and that of Chili will add at least $10,000 more.—*Scientific Journal.*

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IN THE recent brilliant *conversazione* of Sir Edward Sabine at Burlington House, London, Mr. C. F. Varley produced a beautiful luminous arc in an exhausted hydrogen tube placed across the poles of an electro-magnet, the dimensions of which he could vary at pleasure by a change in the size of the negative pole.

Upon the fact that the pure metals increase in resistance as heated in a simple, absolute ratio, Mr. C. W. Siemens has constructed a pyrometer, which, by connection with two Daniels cells, gives an easy and certain mode of ascertaining the heat of articles in furnaces.

These and many other useful inventions were exhibited on the occasion referred to, and the *conversazione* was a very agreeable one.

ANSWERS TO CORRESPONDENTS.

A correspondent asks how many words there are in the following message:

"Jefferson City, Mo., May 14th.

John Jones,
Lebanon,
Illinois:
All right. Come up next week.
John Smith.

Forwarded from Saint Louis May 14th."

By referring to Rule 4, it will be seen that this message should have been sent as follows:

Jefferson City, May 14,
via St. Louis, May 14.

John Jones,
Lebanon,
Illinois:
All right. Come up next week.
John Smith.

9 words.

Can red messages be sent at any time during the day, or only the last thing before closing for the night?

Half-rate messages may be received for transmission at any time during the day, but should not be sent until night. The object aimed at in establishing the half-rate system is to utilize the wires during the night, when they are not occupied with full-paid business.

Should not the number of the pass or some reason accompany all free messages destined for points on other lines?

We do not receive free messages for transmission over the wires of other companies, nor do our passes cover such messages.

Should checks be transmitted on all paid messages going to other lines, whether paid or collect, or only where a part of such check is for other line?

When a message for a station on another line is sent paid, the amount of the tolls for this line should be first stated and then the amount for the other line. When a message for a station on another line is sent collect, the amount of tolls need not be transmitted.

When a paid message is received from another line, the check which is transmitted need not state the amount. When a collect message is received from another line, the amount to be collected for this line should be first stated, and then the amount for other lines.

How are we to report free messages, "Answers to D. H. messages received," if reason does not accompany such messages?

If you do not know on what account they are sent free, you will make an indorsement to that effect upon them, stating that they are answers to D. H. messages received.

In case the tolls on a half-rate message amount to less than 15 cents, can the message be sent as such upon the senders paying the required amount?

Certainly. For example: Suppose a half-rate message containing 10 words is offered for transmission where the full rate is 25 cents, you would take the half-rate message and charge 15 cents. No half-rate message can be taken for less than 15 cents.

As some of the rules in New Book conflict with each other, please give us light upon the following. Rule 4 says: "The message in question would be forwarded to Geneva as follows: Meet me here next Monday at ten (10) o'clock, &c." Rule 6 says: "No figures in the body of a message will hereafter be transmitted."

The example given in Rule 4, in which the word ten is accompanied by the figures (10), is an error not observed until the books were printed. The language should simply be, "at ten o'clock."

Rule 24 says: "Messages must be sent as they are written, which is explicit enough, and looks as if everything that is written should be transmitted, not excluding figures. Several instances have occurred where figures were inserted in transmission and counted, viz: Two (2)—2 words.

Rule 24 contains instructions to operators in regard to the transmission of messages—requiring them to send them as they are written—while Rule 6 gives instructions to the receiving clerk to require the customer in every instance to write all numbers or amounts in words. If a customer chooses to put both the written number and the duplication in figures in his dispatch and pay for both he is permitted to do so. The receiving clerk must see to this, and the operator send the message according to copy.

Your definition in regard to counting everything after signature is also misconstrued. Some offices refuse to receive such messages without counting, others take them.

An executive order has countermanded the instructions previously given in these columns in regard to counting the extra words after the signature, leaving the matter as it was before we gave our definition. Rule 20 provides that no office shall refuse to receive a message from any other office on account of any difference of opinion in regard to counting, the sending office being alone responsible for the proper interpretation of the rule.

◆

A facetious correspondent, the chirp of whose accompanying note greatly pleases us, sends the following example of the operation of the old rule, now abrogated:

Mississippi, May, 1870.

Editor Journal of the Telegraph.

Among the improvements introduced by the new Book of Rules there is none that takes my fancy more than the one abolishing the use of figures in the body of messages to duplicate numbers and fractions. Under color of this too (2) old rule many outrages have been perpetrated in the name of "Sup.," while the fair proportions of many an elegant telegram have been marred by the presence of the inevitable figures.

Read the following message, which, with a different date, address, signature and body, actually passed over the lines of the W. U. Company, under the old *regime*:

Torney, Mass., July 4.

To John B. Threefoot *(3 ft.)*,
Pandemonium, Tenn.

Brown won (1) the fight for once (1c). First knock down for Jones; Brown lost a tooth (2th). Jones's second (2d) is dissatisfied with result. If he tries for another fight I will second (2d) his efforts. Average time per round, four (4) minutes and ten (10) seconds (2ds). Before commencing fight combatants took lunch of bread and slices from a forequarter (4-4) of beef. Both parties displayed much fortitude (42d). After the fight Brown and Jones drank together a glass of half-(½)-and-half (½).

J. Cussnought (0).

Speaking *figuratively*, too many figures cut a sorry figure.

Yours, Hus.

◆

Evans, Col., May 7, 1870.

To the Editor of the Journal of the Telegraph.

Among the many "bulls" published in your journal, you may perhaps find space for one that occurred on our line to-day:

The operator at C. is a new fledged messenger boy from D. office, and had had but little experience with the register yet—dare not trust himself with the sounder alone—so he lets the paper run, with the following result:

MESSAGE AS SENT.

Conductor Freight Train C.

"Car 1,204 loaded with stock and goods is for *Greely. Leave it there. Sig. ———."

[*A station on the road.]

Being fearful of its not reaching him O. K., the sending operator requested C. to repeat it, using the abbreviation, "Pls. R. R. it. (Signed) "X."

Instead of the expected "O. K.," C. responded "1. 1.," and after about 5 minutes answered "O. K."

The train arrived at "X." in due time, when the conductor exhibited the following as the message received:

Conductor Frt. Train C.

"Car 13 l. v. loaded. Stock es good. Sis for Greely. Leave it there. Sig. ———.

Pls. rrits."

After a hearty laugh over it the conductor remarked that C. said on handing it to him that he "didn't understand what that 'rrts' meant, but *that's the way it came.*

The boy got in all the dots but one, but his bad punctuation was rather a serious joke on Greely.

Respectfully, and "73." E. P. H.

◆

Mrs. S. P. Bayliss, Manager Western Union Office, Alton, Illinois, has a daughter 13 years old who is an excellent telegrapher and makes a plain and businesslike copy. Her name is *Lizzie*, and she has been in the messenger service 4 years.—*Com.*

Telegraph to the Adirondacks.

Plattsburgh, Clinton Co., N. Y., May, 1870.

To the Editor of the Journal of the Telegraph:

I have just completed the building of a new line to the Saranac Lakes—business to be repeated at Plattsburgh, N. Y., length of wire from Plattsburgh 76 miles—belonging to the Montreal Company. There will be seven new offices opened next week, as follows: Saranac, Redford, Clayburgh, Franklin Falls, Bloomingdale, Martin's (at Saranac Lake), and Paul Smith's, at St. Regis Lake. This will give all tourists to the Adirondacks a chance to communicate with their friends while sojourning among the lakes and wilderness. Heretofore there has only been a mail route to the lakes twice a week, and people were obliged to stay long without hearing from the other side of the world. I think it would be advisable to announce the fact in your next Journal as a matter of news. The Montreal Company will probably notify the W. U. Company as soon as offices are opened, which will be next week, *if the Fenians don't annex Canada to Ireland.* They are trying it now, having advanced to-day three miles upon Canada soil, which makes stirring times hereabouts, as we are so near the lines. Our wires have been cut a number of times within the past two days. All it will amount to, there will be some *dead* Irishmen that you will miss from New York and other places, and then they will be satisfied.

Yours, &c.,
W. Dow.

◆

The New York and Belgium Telegraph Cable.

"The petition of the American Cable Company for Government aid has been presented in both Houses of Congress, and referred to the Committees on Foreign Affairs. This Company propose to lay a cable to the Azores, thence a branch to Lisbon, and another to London, Havre, and Amsterdam, or the Hague. There is to be no connection with any overland lines, its land cables being laid under ground, and the messages communicated by sound and not subject to repetition." Oh!

◆

The Pacific Cable.

The enterprise is warmly commended by the President, General Sherman, Vice-Admiral Porter, and other members of the Government, and by many of the members of the Senate and House of Representatives of both political parties favorable to the development of American commerce in the East. The distances in nautical miles by the proposed line are as follows: From San Francisco to the Sandwich Islands, 2,080; thence to Medway Islands, 1,140; thence to Yokohama, Japan, 2,260; thence to Shanghai, 1,035 miles. To this is to be added the sixth of the whole to make statute miles (1,086 miles), and also the usual twenty per cent allowance for slack in paying out cable (1,520 miles), making the total length of cable required to connect San Francisco, California, with the Sandwich Islands, Japan, and China, 9,121 miles.

◆

Another Youthful Operator.

Winsted, May 26, 1870.

To the Editor of the Journal of the Telegraph:

H. H. Churchill, Manager W. U. Office at Winsted, Conn., has a son twelve years old who writes well on the key, sending messages to offices where they have no paper as well as where they have. He has practiced it only about six weeks, and of course can read very little by sound.

Still he expects to master that in time. His name is Johnie.

A Friend.

◆

The West India Cables.

Sir Charles Bright arrived at St. Thomas, May 16, from Jamaica to make arrangements for the landing of the cable, the establishment of an office, &c. He will remain here until the arrival of the Dacia, which left London on the 2d, and will then proceed to Jamaica again. It is anticipated the line will be in operation by August.

◆

Twelve English operators arrived at Kingston, Jamaica, May 21, and a number of signal men and station masters are expected soon to follow.

THE SERVICE.

Western Union Telegraph Company, Eastern Division—April, 1870.

APPOINTMENTS DURING APRIL, 1870.

J. Brant	145 Broadway, N. Y.
C. H. Boyle	145 Broadway, N. Y.
Miss A. E. Hudson	Brentwood, L. I
Miss M. S. Joslyn	Dry Dock, N. Y.
A. W. Pearkes	Sandy Hook, N. J.
Miss H. Pratt	145 Broadway, N. Y.
S. S. Reeves	Freehold, N. J.
Miss M. E. Reid	145 Broadway, N. Y.
Miss A. J. Rega	145 broadway, N. Y.
B. Denzler	Brooklyn, N. Y.
W. Murphy	42d street and 6th avenue, N. Y.
J. S. Fleming	Nerepis, N. B.
J. F. Steeves	Musquash, N. B.
John S. Ford	Danbury, N. H.
J. H. Rankin	Northampton, Mass.
E. C. Converse	Newport, N. H.
A. H. Currier	W. Andover, N. H.
W. H. Deforest	Bridgeport, Conn.
Miss L. S. Shumway	Dedham, Mass.
N. F. Hills	Westfield Mass.
H. A. Goodill	Whitesville, Mass.
Miss W. Brown	Waterford, Mass.
J. H. Rugg, chief operator	Albany, N. Y.
H. H. Becker, manager	Amenia, N. Y.
H. F. Peet	Charlotte, N. Y.
Miss L. Burton	Johnstown, N. Y.
R. A. Diefandorf	Phenix, N. Y.
R. A. Gage	Rochester, N. Y.
W. M. Mollett	Syracuse, N. Y.
S. H. Beardsley	Union Springs, N. Y.
N. H. Monck	Utica, N. Y.
Austin Bonrisock	Baltimore, Md.
W. P. Ramsey	Bloomsburg, Pa.
Geo. Allen	Burlington, N. J.
W. B. Willson	Highspire, Pa.
W. P. McCandless	Lancaster, Pa.
Ed. H. Burd	New Brunswick, N. J.
B. P. Humphrey	Hornellsville, N. Y.
Frank Swain	Parkersburgh, Va.

TRANSFERS.

H. H. Atwater	Gold Room, N. Y., to 21 Wall st., N. Y.
G. W. Blanchard	Sandy Hook to Flushing, N. Y.
Robt. Brooks	5th Av. Hotel to Hoffman House, N.Y.
W. F. Sherman	Plaister Cove to New York.
H. S. Hoyt	Boston to Plaister Cove, N. S.
C. B. Robinson	Halifax N. S , to Pictou, N. S.
D. R. Calif	White River Junction, Keene, N. H.
H. C. Sherman	Northampton, Mass , to W. R. Junc.,Vt.
E. P. Bailey	Hillsdale, N. Y., to Mount Kisco, N. Y.
Leon Smith	Mount Kisco to Hillsdale, N. Y.
A. J. Stoddard	Union Springs to Oswego, N. Y.
W. H. Etter	New Brunswick, N. J., to Newark, N. J.
John Fottrell	Newark to Trenton, N. J.
Joseph H. Simpson	Trenton to Philadelphia, Pa.

RESIGNED.

Miss F. E. Burkhelter	New York.
F. H. Greer	New York.
F. C. Lambert	New York.
Miss H. C. Mead	New York.
T. Thomas	New York.
Miss A. Wicks	Medford, L. I.
A. A. Yard	Freehold, N. J.
W. E. Finney	New York.
Miss L. B. Nourse	New York.

DISMISSED.

[We regret to see the names of two good operators, one of them of unusual ability, dismissed for intemperance. Of course we suppress the names]

Thos. L. Earles	Nerepis, N. B.
J. C. Kelly	Newport, R. I.
M. C. Blanchard	Keene, N. H.
Miss H. Adams	Dedham, Mass.
J. H. Rankin	Westfield, Mass.
Ed. Whitton	Whitinsville, Mass.
Miss Amy Burton	Johnstown, N. Y.
D. Conger	Phoenix, N. Y.
C. H. Schermerhorn	Burlington, N. J.
J. E. Cardwell	Philadelphia, Pa.
W. H. Bixby	Hornellsville, Pa.

The West India and Panama Cables.

By our summary of West Indian news it will be seen that a portion of the West Indian and Panama cables had arrived at Jamaica. The United States steamer "Yantic" has been taking soundings along the coast of Cuba, between Batabano and Santiago, and then over to Port Morant, where the soundings have been found considerably deeper than those taken a year or two ago by the "Gettysburg," between Santiago and Annotto Bay. The ground is all of fine, soft clay, all the way from Cuba to Colon, and the greatest depth of water is at a short distance from Colon. The Cuban cable from Santiago—the Panama cable from Colon—and the Windward cable from St. Thomas and Demerara will all be landed in the Plantain Garden River Bay, and will be connected with Kingston by three land wires. The portion of the cable which is to connect Jamaica with Cuba will be laid first. In connection with this expedition we notice in the *London Times* that a steam launch has been constructed by Messrs. Yarrow and Hedley of Poplar for the steamer Dacia, one of the cable laying vessels. It is built of steel, and so arranged as to be lowered from the ship's davits with steam up, in which condition it will weigh from 2 to 2½ tons. The special office this little craft is intended for in the expedition is to assist in laying the shore ends, which generally involves great delay and fatigue by the present mode of employing ship's boats.—*Panama Mail.*

◆

Sir Wm. Thomson, Cromwell Fleetwood Varly, Esq., and Fleeming Jenkin, Esq., have applied to the Government of Jamaica, through Altamont DeCordova, Esq., merchant, their agent in Kingston, for a patent for an invention of improvements in the means and apparatus for working submarine telegraph cables, and Sir William Thomson has applied individually, through the same gentleman, for a patent for improvements in working electric telegraphs.

◆

The United States war steamer "Yantic" arrived at Kingston on the 3d instant, having on board Sir Charles Bright and Mr. M. L. Lizarro of the West India Telegraph Expedition, Mr. Walsh, Secretary to the West Indian and Panama Telegraph Company, and Captain Dubois of the U. S. Navy. The Yantic was engaged taking soundings along the coast of Cuba and on to Jamaica, and would remain at Kingston one week Sir Charles Bright and party were to remain for some time, probably until the arrival at the end of eight or nine days, of the steamer Suffolk from New York. The Yantic would, at the end of the time above mentioned, proceed to Barbadoes and the several other West India ports, taking soundings on the voyage.

◆

P. H. Burns.

To the Editor of the Journal of the Telegraph :

Dear Sir : Looking over the last number of your Journal of the Telegraph I saw and read the notice of the death of P. H. Burns, and as it asked for fuller accounts from some friendly pen I thought I would drop you this note giving you a few particulars, as I am a brother of deceased, and was with him through his sickness.

He came home to his parents, Fishkill Landing, from Boston, where he had just graduated at the Harvard Law School about 4 months previous to his death. He had been complaining for the last year or two, but his ambition was so great and his hopes so strong he would not give up, studying law all day and working at telegraphing at night, as he was on the night wires. From over-exertion and want of proper exercise he soon became broken down in health. He had a severe attack of inflammation of the lungs and hemorrhage which confined him to his bed for six weeks before his coming home. He has been sinking daily since that time, and on Wednesday morning, May 4, at half-past four o'clock, he expired in my arms, after suffering long and severely, which he bore with the most edifying patience.

Jas. E. Burns,
Fishkill on Hudson,
Dutchess County, N. Y.

Omaha.

The Western Union Telegraph Company's office in this city was yesterday removed from its old location to the fine store No. 176 Farnam street, adjoining the Express office.

It is no easy matter to move a telegraph office of the magnitude of that of the Western Union. The business is always of a pressing nature ; no delay in the receipts and transactions ; and for these reasons, when a change is made, the movement must be *instanter.* Such was almost literally the case in the present instance. The wires were worked at the old office until 3 o'clock in the morning, and at 9 o'clock the new quarters were opened, ready for business. About a week ago, Frank Lehmer, the manager of the office, commenced operations in the store on Farnam street, and the arranging and fitting up has been under his personal direction and supervision. The work has been most arduous, and has required a thorough knowledge of telegraphy, in all its mysterious intricacies. That it has been performed with marked success, the entire harmony which prevailed at the office last evening clearly demonstrated. In this work Mr. Lehmer has been assisted by Mr. A. B. Hilliker, one of the best operators in the country, and whose long experience and practical knowledge have made him a valuable auxiliary in the late emergency.

The new office is much more convenient to the public than the old one. The front room, where all the business is transacted, is 57 feet deep and of the usual width. Of this space 38 feet in front is the receiving department, and is in charge of Mr. William Lehmer. In the rear of the reception room is located the office of W. B. Hibbard, the General Superintendent, and Frank Lehmer, the Manager.

The operators' room, 20x32 feet in dimensions, is in the rear of this. There are thirteen tables in the room, each of which has an instrument, and occupied by a distinct wire. Mr. George W. Naile is the chief operator, with the following staff : A. B. Hilliker, A. S. Ayres, M. P. Burr, C. H. Cottrell, and J. D. Walker.

The principal object of interest in this room is what is termed a "plug switch board," with a capacity of twenty wires. It is very neat and tasty, and mounted by a "lightning arrester," which is a sure preventative of danger from the electric current, which might otherwise play sad havoc with the instruments as well as the operators. With it, however, a telegraph office is really the most safe retreat from danger at the hands of the warring elements.

The instruments, thirteen in number, are of the latest improvement, and were manufactured at Ottawa, Ill.

The entire establishment is well lighted and ventilated, and is situated in a locality convenient to those who have business to transact.

The rooms will compare favorably with any telegraph office in the United States.

◆

One of our most efficient superintendents writes us that he has reason to know that on the part of many offices little or no attention is paid to the official notices of tariff changes. When these offices find themselves charged with amounts which they are required to make good, he neglect of duty will come to them with the vigor of the only argument some seem able to understand. But there is another party liable to suffer. As the Company pursues its policy of reducing rates, the public are entitled to immediate participation in the reduction. This cannot be done if managers neglect the orders issued from the Tariff Bureau, and to the necessity of faithfully recording which we call general attention.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, JUNE 1, 1870.

ARREST BY TELEGRAPH.

The practice of arrest on the authority of a telegraphic message, we are glad to see, has been itself arrested by a recent order of Superintendent Jourdan of the New York Police. Hereafter, that officer announces, he will refuse to make arrests upon the authority of telegraphic dispatches unless full particulars as to name, offense, and authority for the apprehension are given. He gives as a reason therefor that telegrams, having been frequently sent without consultation with the authorities, have caused arrests and detentions of parties without sufficient cause and to great personal injury and embarrassment. In fact, every man who desired to injure another has had it in his power, by a dexterous use of his tongue, to get an order to arrest the object of his malignity at such a distance as to effectually accomplish his revenge. Not a few practical jokes of a very embarrassing nature to the victims have been practiced in the same way. The possibility of unnecessary personal injury by such facilities for arrest should be everywhere removed, and such corroborative evidence be made necessary as shall better secure the true ends of public justice.

◆

ASIA.

We have lost the commercial carriage of the Atlantic. The products of both worlds are borne thereon in foreign ships. Why this is so we need not ask. The question is not one we need to answer. The fact is unquestionable.

On the Pacific side the case is reversed. American steamers alone reach China from our shores. Yet the service employs, as yet, only two or three vessels. The route is new and long. The periods of sailing are so separate that European commerce to China via the United States and Pacific Ocean has not, except in the way of travel, been touched. The Postmaster General urges a more frequent service, to be fostered by Government aid, in order to attract this Old World commerce and provide for it. He sees that intercourse with the millions of Asia must eventually open up a large American trade. China and Japan, with all their "gates ajar," must herald intercourse large as that which now renders Europe the summer playground of America. So he says to Congress, you have lost the Atlantic—make sure of the Pacific. A denser population sits waiting for us on that now great western land, than that of all Europe on the east. We hope the call will stir the representatives of the nation to action.

And with the steamer let us have the cable. We regret that it is necessary for the citizen to urge the Government for aid in any enterprise. But this great work cannot be done without it. It is a means for arousing an intercourse which will, on some future day, render the cable self-sustaining, but which for a time must be provided largely by Government aid. We are glad to see so much interest felt in the matter by our wisest public men in Washington, and feel satisfied that whatever aid the condition of the national resources under our heavy debt and with a just reference to the national policy will permit, will be willingly granted, even if it be delayed.

Since the above was written we are happy to receive the announcement that the Committee on Foreign Relations have reported a bill carrying out the object of Mr. Field's memorial for aid in laying a cable to China, and adversely to all others of like character.

The corporators named in the bill are Cyrus W. Field, Peter Cooper, Moses Taylor, Marshall O. Roberts, Wilson G. Hunt, Samuel F. B. Morse, Dudley Field, William H. Webb of New York, and Darius Oden Mills of California. It authorizes the construction and maintenance of one or more cables from California to China and Japan, either direct or by way of the Hawaiian or other islands, and grants the right of way where the United States have jurisdiction. The capital stock to consist of 100,000 shares, and a total of $10,000,000 in gold, with power to increase the same by vote of the stockholders when the whole amount has been subscribed and paid in, which shall be within one year from the organization. Nine directors are to be elected, a majority to be citizens of the United States, and no dividend shall be declared that would impair the capital stock. The office of the Company shall be either at New York or Washington, and all meetings of the directors must be held at that office. The President is authorized to detail vessels to make surveys, soundings, &c., to assist in the work. The bill also provides that the Government shall have the right to transmit annually, free of charge, over the line, messages on Government business to an amount not exceeding $500,000 in any one year, all in excess to be paid for at regular tariff rates. In aid of the enterprise the Government is required to pay to the Company annually from its successful completion $500,000 in gold for twenty years. The line is to be completed in five years from the date of the act. The tariff rates for messages of ten words, including address, date, and signature, are as follows: Between California and China, $30 in gold; between California and Hawaiian Islands, $5 in gold; thence to Midway Islands, $5 in gold; thence to Japan, $10 in gold; from Japan to China, $5 in gold; and the same in proportion for every additional word over ten.

With the use of such a cable, the United States can direct her own interests on the Pacific without the necessity of using foreign lines, and, at the same time, provide to commerce a greatly needed channel of information and control.

In reference to the obstacles which naturally suggest themselves in connection with so great an enterprise, and which a few years ago would have been deemed insurmountable, Professor Morse wrote some time ago as follows to Mr. Field:

> "You have a much easier task now in presenting the enterprise to intelligent men than we had in 1856 in explaining its nature and advantages to the British public, since experience has verified in modern history the prophecies then advanced in respect to the Atlantic cable. It was not until after a knowledge of the result of the satisfactory experiments on the night of the second of October, 1856, detailed in my letter to you of the next morning in London, that the commercial world awoke to the importance and feasibility of so novel an enterprise.
>
> "I am persuaded that the experiment of that memorable night, the arrangements for which were under the supervision of Sir Charles Bright, Dr. Whitehouse, the late lamented Mr. Brett, and myself, so far dissipated the doubts which naturally environ an untried project, that capitalists were induced to venture their investments in it.
>
> "I see no obstacles, scientific or physical, in your proposed Pacific cable which have not been completely removed by the experience of the Atlantic cable. Indeed, this experience is the best guarantee of success in the Pacific.
>
> "SAMUEL F. B. MORSE."

◆

A NOVELTY IN TELEGRAPHY.

There are two telegraph stations on the Island of St. Pierre, one the station of the French and the other that of the Anglo-American Company's lines. The instruments of the French Company are the invention of Sir William Thompson, and are very sensitive. These instruments were found to be seriously affected by earth currents which interfered very much with the telegraph signals. The difficulty was removed by taking up the usual ground connection and laying an insulated wire about three miles long from the station to the sea, in which a large metal plate was immersed and to which the wire was affixed. The changes in the electrical condition of the sea being small and slow, the active electric changes of the dry rocky island were thus avoided. This wire became the ground wire of the station.

But after this had been done it was found that part of the so-called earth currents had been due to the signals sent by the American Company into their own lines! By using an ordinary ground wire at the French station and connecting it with the insulated wire to the sea through the receiving magnet, the messages being sent over the American Company's wire *were clearly indicated*, and, indeed, automatically recorded by Sir William Thompson's syphon recorder! The American station is several hundred yards distant, and the cables do not come near each other at any place. The only connection, therefore, was by the earth. How was this accomplished?

It appears that the battery of the American Cable, when the key became closed in the act of transmission electrified the entire island, becoming thus a kind of Leyden jar. The insulated wire to the sea gave the means of a partial discharge, just as the telegraph land wires aid in restoring the disturbed electricity of the earth during auroral displays. So, passing over this sea wire the messages of the American Cable could be all received by the French operators without other connection, and were recorded at pleasure! So it seems messages may be stolen without cutting into wires. Happily, the remedy is easy. The sea relief wire is the invention of our friend C. F. Varley.

◆

British Postal Telegraph.

MESSAGES SENT APRIL 9 TO MAY 7, 1870.

Week ending April 16	157,907
Week ending April 23	170,659
Week ending April 30	172,746
Week ending May 7	175,664

The daily delivery in London is as follows:

WEEK ENDING MAY 7.

Sunday	194
Monday	2,172
Tuesday	2,787
Wednesday	2,811
Thursday	2,824
Friday	3,117
Saturday	2,233

◆

THE following rather unique resolution was passed at the recent meeting of the British Indian Telegraph Company in London:

Resolved, That the company *shall* be and is *hereby* required to be wound up *voluntarily*."

OFFICIAL STATEMENT.

Western Union Telegraph Company.

	April. 1869.	April. 1870.
Receipts	$602,827 30	$578,378 76
Expenses	383,844 17	400,486 75
Net Profit	$218,983 13	$177,892 01

◆

At the semi-annual meeting of the Board of Directors of the Western Union Telegraph Company, held at their rooms, 145 Broadway, N. Y., June 1, 1870, it was deemed inexpedient to declare any dividend upon the stock of the Company.

◆

Atlantic Cable Interruptions.

Only one wire now connects America with Europe. The breaking of that wire would be a great commercial disaster, and test the stability of many a commercial house. In some features of existing commerce the wires alone make its transaction possible. The two Atlantic cables between Newfoundland and Ireland were completed July 27 and September 8, 1866. One of the cables during this period has been interrupted as follows:

	Days.
1st. From May 8, 1867, to June 19, 1867	49
2d. From July 20, 1867, to Sept. 20, 1867	62
3d. From Aug. 3, 1868, to Oct. 11, 1868	69
4th. From July 23, 1869, to Oct. 24, 1869	94
5th. From Sept. 25, 1869, to the present date (not being yet repaired), viz: May 24, 1870	241
Total	508

or over 36 per cent. of the whole time. There has not been, however, a single moment since July 27, 1866, but what one of the cables has been in perfect working order. In this respect ocean telegraphy has been a most triumphant success, to which land lines can lay no claim. Beneath all storms the cables lay comparatively secure. The French cable ceased to work May 26. The interruption, the cause of which is unknown, is one hundred miles east of Halifax, N. S. A steamer is being put in order to have it repaired without delay.

◆

The following were the prices in London, May 21, 1870 of the stocks of the submarine telegraph cables laid this year, and under contract to be laid to complete telegraphic comunication between England and China:

	Par.	*Selling Price.*
British-Indian Submarine (successfully completed in March)	£10 paid in full.	15 per cent. discount.
Falmouth, Gibraltar and Malta	£10 paid in full.	20 per cent. discount.
British-Indian Extension	£10 paid 70 per cent.	30 per cent. discount.
China Submarine	£10 paid 20 per cent.	30 per cent. discount.

◆

The Boston Board of Trade.

A special meeting of the Board of Trade was held at the rooms in Chauncy street.

Among other distinguished gentlemen present were his Excellency Governor Claflin, his Honor Mayor Shurtleff, Governor Fairchild of Wisconsin, Governor Page and ex-Governor Underwood of Vermont, Hon. John Young, President of the Board of Trade of Montreal, Hon. Walter Shanly of Canada, and others.

Hon. A. H. Rice, President of the Board, occupied the chair. A communication from Cyrus W. Field was read in relation to his scheme for a cable across the Pacific, and the following resolution was passed:

Resolved, That in view of the increasing interest of the people of the United States in the commerce of the Pacific Ocean, the Boston Board of Trade would respectfully ask the careful consideration of Congress to the memorial recently addressed to it by Mr. Cyrus W. Field, praying for the incorporation of a company for the purpose of laying a submarine cable across the Pacific to Japan and China, either direct or by the way of the Hawaiian Islands, and asking such assistance by the National Government as Congress may consider to be necessary to insure the speedy completion of the enterprise.

L. G. TILLOTSON & CO.

Removed to No. 8 Dey Street, New York.

It will scarcely be credited that the New York sales of this firm during last month were almost, if not quite, $60,000. A demand for telegraph wire of the make of R. Johnson & Nephew, Manchester, England, of which Tillotson & Co. are agents, has sprung up during the last year which threatens to exclude the American manufacture. Two causes produce this result. The wire is of admitted excellence. It has stood a severe examination and test. It is also cheaper than the wire of American manufacture. Why this should be we do not know. The fact is clear enough. Thousands of miles are imported monthly by Tillotson & Co. to meet what seems a growing demand. An immense railroad extension throughout the country has made this house also noted for its railroad material, of which it ships daily large amounts. Nor is telegraph machinery the least important of its stock. There seems no end of the demand for all kinds of electrical appliances. So like all growth, more room is needed. No. 11 Dey street being too small, No. 8 has been secured. It is roomy, large, and convenient. Wares are arranged so as to aid examination. Deep, dry cellars receive shiploads of wire. The whole appearance now corresponds with the Principal, who, as everybody knows, has great breadth of beam and wondrous capacity. We kiss our hand to No. 8, and wish it success.

◆

Bishop's Telegraph Cables.

A change will be observed in the standing advertisement of our old friend, Samuel C. Bishop, proprietor of the Bishop Gutta Percha Works, Nos. 422, 424, and 426 East Twenty-fifth street, New York, which we deem important. It has not appeared creditable to us as a nation that our commerce should be carried across the ocean in British ships, and our cables made in British shops. America ought to be able to make her own cables, even if she continues to import so largely English wire with which to make them. It will scarcely be credited that within a few months 12,000 miles of English wire has been sold by the one firm of Tillotson & Co. for telegraph use.

Respecting Mr. Bishop and his work nothing is needed from us, for his manufactures are well and widely known, and we commend him to a greatly enlarged business and appreciation. It is certainly a comfort to know that a perfect cable can be bought in New York, as thoroughly and carefully constructed, and as cheap, as in any of the great cable establishments abroad.

◆

GRAY & BARTON.

479 State Street, Corner Eldridge Court, Chicago.

By a change in the special advertisement of this young and fortunate firm, a third change has been made necessary, in order to provide for the large business which has been thrust upon them by the wonderfully increasing necessities of the great West. The establishment of Gray & Barton has been recently removed to the corner of Eldridge court, 479 State street, Chicago, to the large building occupied by the Illinois Manufacturing Company, where they have largely increased their machinery for manufacture, and the variety and amount of their tools. They are now ready for any amount of service which may be demanded of them. We know they will do it well and honorably, and they offer greater promptness than ever before. The Morse Telegraph Registers are made from the castings of the well-known instruments made at the Caton shops of the Western Union Telegraph Company, Ottawa, Ill.

◆

Mr. I. N. Miller, the gentlemanly Superintendent of the M. & C. Telegraph line, was the recipient on Saturday last of a handsome service of silver plate at the hands of the operators along the line. The offering was a testimonial of the reepect and esteem in which Mr. Miller is held by his friends, and is worthily bestowed and well deserved. The service consisted of pitcher, salver and two goblets, all handsomely chased and of the most elaborte workmanship, the goblets being gold lined. The inscription on the pitcher read as follows: "Presented to Mr. and Mrs. I. N. Miller by M. & C. Telegraphers, May, 1870."

☞ *For Tariff Circular see page* 161.

◆

Charles T. & J. N. Chester.

In a new advertisement of this old and well-known firm, whose prosperity has been as amazing as it has been deserved, will be found an announcement of their having secured the *exclusive agency* for the use and sale of Kerite and articles made thereof. We have long designed to publish the references to this material in the official report of the Paris Exposition, but have been prevented by the pressure of other matter. Prof. Silliman testifies to its continued resisting qualities, even after long exposure, as superior to the most careful preparation of gutta percha. Mr. Farmer, our thoroughly conscientious electrician, states that a test made with an instrument which would show a current through 300,000 miles of wire, showed no deflection in a test of 196 feet of kerite covered wire submerged in water! Such testimony seems conclusive of excellence. To this maximum of excellence, through our various enterprising establishments, we are fast coming. The American telegraph system demands the best of everything, and we are glad that an old and honored firm are doing their share in providing it.

◆

THE MORSE TESTIMONIAL FUND.

What we said in our last issue we repeat in this. We believe the idea of a testimonial to Professor Morse by the operators of America is a thought so grateful to every true heart that no man in the service can afford to withhold his hand from aiding its most triumphant success. The time will come when every man who has declined participation in it will regret it profoundly, and yet we know that many will refuse.

1. Some will pay nothing because the subscription is not strictly a *one dollar* token from every man. It may have been better so. But the amount given is more likely to be indicative of ability than will. Let no man feel that it is anything but a *one dollar* subscription, yet let us all be glad if any one is able and willing to give more, or gives less. The messenger's twenty-five cents is as significant as the twenty-five dollars of the president who put his name down to say to all of us: "I am heartily with you in this good thing."

2. Some will withhold because they don't like *us*. Now we cannot convince you of your folly in this most unwise dislike. Remember, this thing is for Professor Morse, the handsomest, kindest-hearted, nicest old gentleman in Christendom. When you have an engraved likeness of him hanging over your parlor mantle you will be proud that your dollar was given. Regard us as simply your servant in aiding you to do a delightful duty.

3. Some will withhold because we wrote against the "strike" and because this is a "Western Union" movement. Now we are fond of funerals that bury this world's griefs and hatreds. Mr. Morse belongs to us all. The movement is neither official, nor sectional, nor partisan, nor personal. We want no glory from it but the honor of its labor. The Western Union Company, as such, has nothing to do with it. It is open to all. But we need not say more. It is to be a success. We have a letter from Chicago, promising that the Great West shall show her hands in good time. We believe it. Let every State do her best. Let the large offices, if they choose, imitate Dunkirk, Bangor, Toledo, Washington, Binghamton, Savannah, and Aspinwall, and send separate lists. Let every man have a chance and every manager be a committee.

We have received the following since our last:

HERE HE COMES!

New York, May 18, 1870.

Friend Reid: I presume you do not intend that I shall not have the pleasure of contributing to the fund for "The Morse Testimonial," but as I have not been solicited I shall avail myself of my privilege of inclosing you my check for twenty-five dollars for that worthy object. I heartily wish the Professor may live to enjoy the society of his numerous friends and admirers many years longer.

Yours very truly,

Samuel C. Bishop.

Friend Bishop, give us your bones. We give you a whole holiday for that.

Our old friend Gifford is on hand. The best committees are those who go at the work *con amore*. "Sid" is always true to his old reputation.

☞ *Turn over and read.* ☞

SEVENTH DISTRICT—EASTERN DIVISION.

Forwarded by S. B. Gifford, Superintendent.

Miss Mattie A. Lieb	$1 00	P. O. Wright	$1 00
M. W. Griffin	1 00	C. M. Sabin	1 00
D. T. Newton	25	R. A. Diefendorf	50
B. H. Griffin	25	S. C. Suydam	2 00
C. A. Hammond	1 00	A. H. Crawford	1 00
William Ault	1 00	R. E. Rindge	1 00
D. G. Willie	1 00	C. P. Burghardt	1 00
J. J. Larwood	2 00	J. D. Rindge	2 00
Mrs. M. E. Baker	1 00	Miss T. V. House	1 00
Miss S. B. Watson	1 00	A. H. Mudge	1 00
J. W. Burroughs	1 00	C. B. Warren	1 00
E. G. T. Adams	1 00	W. W. Wright	1 00
C. F. Moseley	1 00	J. Watson	1 00
T. V. Hawley	1 00	S. Barnes	1 00
V. A. Hungerford	1 00	H. Case	1 00
H. W. Miller	1 00	C. H. Christy	1 00
E. Salmon	1 00	D. L. Pike	1 00
W. H. Griffith	1 00	D. V. Ferris	1 00
S. M. Hunter	1 00	J. C. Kelly	1 00
C. H. Pixley	1 00	P. Kelly	1 00
H. F. Post	1 00	A. J. Schall	1 00
G. D. Butler	1 00	J. H. Topliff	1 00
R. A. Gager	1 00	S. B. Gifford	5 00
H. Mulligan	1 00	E. H. Crawford	1 00
P. K. Jones	1 00	W. M. Mallett	1 00
W. C. Hadley	1 00	A. B. Waite	1 00
H. L. Gregg	1 00	J. A. Ecker	1 00
A. J. Gregg	1 00	J. W. Houson	1 00
A. W. Johnson	2 00	Mrs. L. R. Neely	1 00
Miss M. L. Peck	1 00	F. Sibson	1 00
Miss A. M. Howard	1 00	W. O. Shelley	1 00
E. B. Latimer	1 00	H. A. Case	1 00
Miss Josie V. Paine	1 00	J. T. Walton	1 00
C. A. Runyen	1 00	L. E. Phillips	1 00
J. B. Browning	1 00	W. B. Sylvester	2 00
J. A. Sutherland	1 00	Jacob Van Woort	2 00
A. H. Latz	1 00	J. B. Kennedy	1 00
W. H. Steiglemaiere	1 00	A. B. Doig	1 00
J. A. Casterlin	1 00	H. S. Bowen	1 00
T. A. Graham	1 00	I. M. Slater	1 00
T. J. Tobin	1 00	J. J. Fish	1 00
C. E. Chesebro	1 00	J. W. Weller	2 00
O. Dimmick	1 00	D. M. Bowers	1 00
E. H. Rich	5 00	C. L. Cotton	1 00
C. W. Nelson	1 00	S. R. Howe	1 00
O. E. Wood	3 00	B. D. Sanders	1 00
C. M. Perrige	1 00	A. C. Stebbins	1 00
Miss Alice Goodell	1 00	J. F. Ewin	1 00
D. W. Pardee	1 00	W. S. Walcott	2 00
E. B. Brundage	1 00	A. G. Pettibone	1 00
Miss Hattie Hollister	1 00	W. J. Piper	1 00
J. P. Merrill	1 00	W. H. Schall	1 00
J. H. Conrad	1 00	J. C. Redman	1 00
R. E. Runyan	1 00	C. Wait	1 00
J. O'Neil	1 00	J. A. Storer	1 00
H. A. Tuttle	1 00	George Van Der Veer	1 00
A. J. Studdard	1 00	G. C. Wood	2 00
J. A. McDonald	1 00	Miss Libbie Burton	2 00
J. Fuller	1 00	A. D. Bedford	1 00
George Hall	1 00	A. T. Kehoe	1 00
C. A. Leib	1 00		

A number of others not yet received will be forwarded when list is regarded complete. S. B. GIFFORD.

The undersigned, employees of the Western Union Telegraph Company's

WASHINGTON (D. C.) OFFICE,

hereby subscribe the respective amounts named herein toward securing the proposed Testimonial to Prof. Morse:

Charles A. Tinker	$3 00
Robert W. Bender, operator	1 00
C. F. Loomis, operator	1 00
James A. Swift, operator	1 00
Bennett R. Bates, operator	1 00
Wm. Dyer, operator	50
Jno. F. McConnell, operator	1 00
Geo. C. Maynard, operator	1 00
Wm. G. Jones, operator	1 00
A. H. Kanode, operator	1 00
A. S. Adams, operator	1 00
Benj. F. Johnson, operator	1 00
Harry A. Wells, operator	1 00
Edward C. Stewart, operator	1 00
John Happ, clerk	1 00
J. C. Noyes, clerk	1 00
Ed. Curren, clerk	1 00
James H. King, clerk	1 00
Henry C. McCann, clerk	1 00
Leonard Whitney	2 00
Morell Marean, operator	1 00
J. C. Tallman, operator	1 00
Paul D. Connor, lineman	50
G. Jones, clerk	1 00
Fred. W. Royce, operator	50
F. D. Squire, operator	1 00
John Stalcup, operator	1 00
Benjamin Johnson, operator	1 00
Cornelius Wells, operator	1 00
H. C. Lombard, operator	1 00
T. H. Fuesworth, operator	1 00
M. F. Connor, operator	1 00
Jas. Hailey	1 00
H. S. Larcombe	1 00
J. A. Kerbey	50
Total	$36 00

Remitted to John Horner, Treasurer, May 24, 1870, by telegraphic money order. CHAS. A. TINKER.

ALL HAIL, SUNNY SOUTH!

S. P. Evans, Florence, S. C.	$5 00
John D. Easterlin, Charleston, S. C.	2 00
W. Hancock, Charleston, S. C.	2 00
Geo. W. Bell, Charleston, S. C.	2 00
W. R. Cathcart, Columbia, S. C.	2 00
P. H. Ward, Marion, S. C.	$2 00
L. W. Capers, Charleston, S. C.	1 00
D. M. Driscoll, Charleston, S. C.	1 00
C. V. Lamb, Charleston, S. C.	1 00
P. E. Ryan, Charleston, S. C.	1 00
W. J. Evans, Charleston, S. C.	1 00
T. W. Stanland, Charleston, S. C.	1 00
W. J. Malloe, Charleston, S. C.	1 00
P. K. Henger, Charleston, S. C.	1 00
J. R. Ligon, Branchville, S. C.	1 00
P. D. Sivens, Pocotaligo, S. C.	1 00
T. C. Greer, Kingsville, S. C.	1 00
S. K. McDonald, Winsboro, S. C.	1 00
W. W. Starr, Jr., Rock Hill, S. C.	1 00
C. H. Breunecke, Chester, S. C.	1 00
J. P. Bignon, Aiken, S. C.	1 00
Jos. Flinn, Kingsville, S. C.	1 00
B. T. Howard, Columbia, S. C.	1 00

NOW COMES THE CHARLESTON BOYS!

We like to see these little sums:

T. W. Dean, Columbia, S. C.	50
Ossian Goulden, Columbia, S. C.	50
Wm. Fleming, Charleston, S. C.	50
J. T. Rivers, Charleston, S. C.	25
J. E. Toye, Charleston, S. C.	25
Wm. Burns, Charleston, S. C.	25
Richard Corbett, Charleston, S. C.	25
J. R. Eadre, Charleston, S. C.	25

GOOD MORNING, LITTLE RHODIE!

H. C. Bradford, manager, Providence, R. I.	$5 00
H. N. Williams, operator, Providence, R. I.	2 00
W. P. Phillips, operator, Providence, R. I.	2 00
A. C. White, operator, Providence, R. I.	1 00
P. J. Hurlbut, operator, Providence, R. I.	1 00
A. L. Sussman, operator, Providence, R. I.	1 00
J. H. Ingraham, operator, Providence, R. I.	1 00
W. H. Munro, operator, Providence, R. I.	1 00
W. E. Gonsalve, clerk, Providence, R. I.	1 00
G. B. Horton, Jr., clerk, Providence, R. I.	1 00
W. A. Harris, clerk, Providence, R. I.	1 00
M. H. Crane, clerk, Providence, R. I.	1 00
J. W. Green, clerk, Providence, R. I.	1 00

Here come the Providence boys with their quarter dollars! All honor to them! Fall in to the ranks, boys, every where. We would like to see a monument built by them alone.

J. B. Gaynor	25	A. Holt	25
W. H. Pennell	25	T. E. Coleman	25
G. W. S. Burroughs	25	C. A. Downey	25
J. J. Dillon	25	O. Patterson	25
R. Baens	25	C. O. Lewis, lineman	50
J. T. Little	25		

Here come the ladies! God bless 'em all!

Miss E. A. Arnold, Apponaug, R. I.	1 00
Miss Lizzie Briggs, Kingston, R. I.	1 00
Miss Ada B. Hall, Wickford, R. I.	2 00
Miss C. Mahew, Richmond Switch, R. I.	1 00
Miss E. Adams, Woonsocket, R. I.	1 00
Miss J. Husbee, Lonsdale, R. I.	1 00
Miss A. McInerny, River Point, R. I.	1 00
Miss C. M. Lawson, Pawtucket, R. I.	1 00
Miss L. A. Pipkin, Madison, Florida	1 00
Miss J. D. Proud, Newport, R. I.	1 00
Miss A. Burlingame, Westerly	50
Abm. Perry, messenger, Pawtucket	50
T. C. Douglas, Hunter's Point, L. I.	1 00
W. C. Magee, Sloans' C. & P. R. R.	1 00
W. H. Chapan, operator, Conesus E. R. R.	1 00
J. A. Wilson, Quincy, Florida	1 50
O. Ross, St. Marks, Florida	2 00
Jas. L. Taylor, Tallahassee, Florida	2 00
C. L. Hatch, Jr., Tallahassee, Florida	2 00
B. P. Bassett, messenger, Tallahassee, Florida	50
N. G. Upson, Nunda, N. Y.	1 00
Samuel C. Bishop, gutta percha works	$25 00
Samuel S. Truss, Crisfield, Md.	1 00
Robert Moore, manager, Canonsburg, Pa.	1 00
Tracy Robinson, Panama Railroad Telegraph	1 00
E. Ogden, Panama Railroad Telegraph	1 00
D. B. Burnett, Panama Railroad Telegraph	1 00
H. Lefevre, Panama Railroad Telegraph	1 00
Stanley McNider, Panama Railroad Telegraph	1 00
C. A. Thomas, Panama Railroad Telegraph	1 00
Geo. H. Bliss, superintendent, Chicago, Ill.	10 00
Frank P. Brown, Savannah, Ga.	1 00
John Miller, Savannah, Ga.	1 00
C. H. Rogers, Savannah, Ga.	1 00
A. J. Rauh, Savannah, Ga.	1 00
Thomas A. Davis, Savannah, Ga.	1 00
C. H. Wall, Savannah, Ga.	1 00
J. W. Jones, Savannah, Ga.	1 00
W. H. Turner, manager, Savannah, Ga.	5 00
A. Potter, Lawton, Ga.	1 00
Geo. McAvoy, Lawton, Ga.	1 00
Thomas R. Rusk, Athens, Ga.	1 00
Ike H. Fonda, Fonda, N. Y. Geo. F. Clark, Fonda, N. Y. T. H. Fonda, Fonda, N. Y.	5 00
D. Douglas Forbes, manager, South Brooklyn	2 00
H. N. Drury, manager, Burlington, Vt.	2 00
M. N. Dickenson, manager, Warrensburgh, N. Y.	1 00
W. F. Smith, Artesia, Miss.	1 00
Adelia Adgate, Yonkers, N. Y.	1 00
R. F. Makepeace, New York	1 00
J. Schnell, manager, Binghamton, N. Y.	1 00
M. Elser, operator, Binghamton, N. Y.	1 00
John Mack, messenger, Binghamton, N. Y.	50
Sebe E. Lamoureaux, messenger	50
W. H. Miller, operator, A. & S. Railroad office	1 00
George G. Hadley, operator	1 00
Geo. Snyder, operator and train dispatcher	1 00
J. H. Root, operator, A. & S. R. R.	1 00
P. Mooney, repairer	1 00
George M. Phelps, superintendent	5 00
R. E. Torrington, operator, Cameron Junction, Mo.	1 00
John R. Duret, Brookfield, Mo.	1 00
W. D. Simpson, Brookfield, Mo.	1 00
T. S. Beeler, Brookfield, Mo.	1 00
W. T. Hall, Live Oak, Florida	1 00
George Bliss, Waldoboro, Me.	3 00
James P. Richmond, Plymouth, Ind.	1 00
Edward Fitzgerald, Plymouth, Ind.	1 00
Willie Fitzgerald, messenger	1 00

Now come along all the rest of you. If you want to be honored and happy, let your heart have something to do and your pocket likewise.

To show that no exclusiveness is desired, we take pleasure in nominating as additional committees:

J. N. ASHLEY, Esq., Editor of the *Telegrapher*, New York.

DAVID MCCARGO, Esq., Superintendent P. & A. Tel. Co., Pittsburgh, Pa.

H. H. WARD, Esq., Superintendent Anglo-American Tel. Co., New York.

Others will appear in our next number.

◆

MAY 15, a circuit of 4,800 miles of the wires of the Western Union Telegraph Company through 18 States, commencing and terminating at New Orleans, La., and connecting by repeaters at Rome, Ga.; Lynchburg, Va.; New York City; Pittsburgh, Pa.; two at Cincinnati; St. Louis, Mo.; Chicago, Ill., and Memphis, Tenn., was worked with ease, and with the rapidity of an ordinary circuit, by Mr. B. C. Duncan, chief operator at New Orleans. At New York the line to Plaister Cove, N. S., was connected and responded promptly to the New Orleans manipulator.

◆

Telegraphers' Mutual Life Insurance Association.

ASSESSMENT NO. 12.

Edwin Evarts,
John E. Ash,
Wm. Blanchard
James Murray,
J. B. Graham,
E. F. Wheedon,
F. T. Smith,
C. H. Smith,
Geo. A. Dodd,
J. W. Sampson,
W. H. Champlin,
W. L. Ives,
R. G. Warth,
L. B. Greene,
J. A. Cure,
F. S. Smith, 11 and 12.
J. T. Maxwell,
Sam. Porter,
H. D. Scott,
W. J. Evans,
J. H. Emerick,
W. H. Collins,
B. A. Pryor,
E. B. Goelet.

It is now three months since the last death in the Association. Since that time 94 persons have joined the Association.

◆

Married.

BENSTER—JONES.—On May 10, at Bell Creek, at the residence of the bride's father, by Rev. J. B. Chase, Mr. Joshua Benster, Manager W. U. Tel. Office of Laramie, and Miss Cora E. Jones, daughter of Rev. L. H. Jones of Bell Creek.

CLUTE—MULLIN.—In New York, on the 14th instant, Charles C. Clute to Sarah Agnes Mullin of St. John, N. B.

FOLLETT—MOORE.—At the Church of the Holy Cross, Troy, N. Y., May 12, by Rev. J. I. Tucker, assisted by Rev. E. T. Chapman, Benjamin T. Follett of the W. U. Tel. Co., to Miss Maggie H. Moore, both of Troy.

POPE—PORTER.—At the residence of the bride's father, Pittsfield, Mass., Tuesday, May 10, by Rev. Mr. Wells, Mr. Henry W. Pope of Elizabeth, N. J., to Miss Lucy D. Porter of Pittsfield, Mass.

We acknowledge receipt of an elegant satin papered box containing a slice of most delightfully aromatic cake with the notice above. We hope never to record any "strike" between these two amiable P.'s, although in due time we shall be happy to learn of the increase of Popery in the quiet town of Elizabeth, N. J., and shall make a note of it.

PRESSLY—GIBBONS.—May 19, in Rome, Ga., at the residence of the bride's father, by Rev. W. F. Cook, Mr. James H. Pressly of the Western Union Telegraph Company, one of the most faithful men who ever touched a telegraph key, and a man to be loved by any noble-minded woman, to Miss Lou U. Gibbons.

Mr. Pressly was one of the men who stood by us in our hard work of restoring the Southern lines, which have since made other men rich. There is not a truer man who ever put his heart in a fair girl's keeping. May they live a thousand years.

REYNOLDS—MAYNARD.—In Norwich, Conn., May 26, by Rev. A. H. Wilcox, Mr. G. Merton Reynolds and Miss Anna E. Maynard, both of that city.

WILKINSON—McCANN.—In Blissfield, Mich., May 10, at the residence of the bride's father, by Rev. Boyer, Marvin B. Wilkinson of the L. S. and M. S. R. R., to Miss Belle McCann.

◆

Born.

FAWCETT.—May 14, at McLean, Ill., to Mrs. F., wife of A. V. Fawcett, Operator W. U. Tel. Office, a son—9 pounds.

HARTMAN.—In Alburtis, Pa., May 10, to J. P. Hartman, Manager W. U. Tel. Office, "a bouncing boy, weighing 9½ lbs."

MILLER.—April 30, at Shreeve, O., to Edward O. Miller, Manager W. U. Tel. Office, a son "9 pounds."

NEW

SUBMARINE CABLE.

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & ÆRIAL WIRES,

OF THE

HIGHEST INSULATION.

CHARLES T. & J. N. CHESTER,

No. 104 Centre Street,

EXCLUSIVE AGENTS,

offer for sale, as TELEGRAPH and ELECTRIC CONDUCTORS, Wires protected by the BEST INSULATOR and STRONGEST RESISTANT TO CHEMICAL ACTION and ATMOSPHERIC INFLUENCE.

After the experience of several years in the use of KERITE for purposes of insulation, we have concluded to adopt it as the very best substance for wire covering, not only for use of offices but for SUBTERRANEAN, SUBMARINE and ÆRIAL LINES. We have used it unprotected for years under ground, and exposed to the most injurious atmospheric influences—to heat, cold, and moisture—and have yet to learn its failure, when other ordinary insulating substances would have been rapidly destroyed. UNDER WATER it has retained an electrical charge for many hours, thus ranking it in the HIGHEST GRADE OF NON-CONDUCTORS.

We have, therefore, made arrangements not only to secure THE EXCLUSIVE AGENCY for its sale, for the purposes for which we have already sold it so largely, but to furnish complete

IRON-CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

In corroboration of our statements we append extracts from reports of those who have exposed it to the severest practical tests.

FROM PROF. SILLIMAN OF YALE COLLEGE

"Nov. 10, 1868.

"I am satisfied, as the result of my own researches, that Ozone is by far the most fatal of atmospheric influences. I have submitted portions of KERITE to the action of a highly ozonized air for a sufficient length of time to prove them, and at the same time have exposed the best English Gutta Percha Covered Cable to the same tests with the following result: After long exposure, KERITE resists perfectly! The best English Gutta Percha Cable was speedily destroyed. A few days' exposure to Ozone would produce more effect than many years in a normal atmosphere exposed to Carbonic Dysulphide, Nitric Acid, Sulphuric Acid, Sulphuric Dioxide, Nitric per Oxide Chlorine Gas, and Alkaline Hydrates. Gutta Percha is immediately dissolved in Carbonic Disulphide, and powerfully acted on by Alkaline Hydrates. Some samples of KERITE resist the action of the former in a surprising manner, and are completely unaffected by the latter."

"NEW YORK, May 14, 1870.

"In nearly two years since the foregoing was written I have made a considerable number of experiments upon the KERITE Compound of A. G. DAY, all of which tend to confirm former results; while the practical test of the continued use of electrical conductors covered with it and the growing favor with which they are received by electricians, offers the best guarantee of its permanent value. B. SILLIMAN."

FROM MOSES G. FARMER OF BOSTON, MASS.

"I have tested 195 feet of this wire and found it a better insulator than Gutta Percha.

"The instrument used would have shown a current through 300,000 miles of telegraph wire. The 195 feet showed no leakage in water. The KERITE insulated wire withstands atmospheric agencies wonderfully, and will last for years when exposed to the atmosphere; likewise when buried in the earth there is no reason to apprehend decay. It is a well known fact that Gutta Percha deteriorates very rapidly when exposed to atmospheric influences, and therefore cannot be advantageously used for the covering wire for outdoor exposure, unless buried in permanent moisture."

FROM MR. E. A. CALLAHAN, SUPERINTENDENT GOLD AND STOCK TELEGRAPH CO.

"MAY 14, 1870.

"Under all circumstances it has given me the fullest satisfaction. The peculiar nature of our business renders it necessary for us to use the most perfectly insulated wire. I have tried several kinds of insulated wire, but have been compelled to take down and substitute KERITE instead. Wire strung a year since is as good as the first day put up; have tested it after three days' constant rain, and could not find one degree of escape. We use it in gas pipes, and sometimes placed near furnaces subject to very high temperature. I have not been able to detect the slightest change from its original condition.

"We have exposed it to the extreme cold and heat of the past two years and a half, strung over the roofs of buildings, which we consider the best test of its indestructible and insulating qualities."

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SUBMARINE TELEGRAPH CABLES,

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TELEGRAPH AND ELECTRIC USE, and for

BLASTING AND MINING PURPOSES,

in every variety desired.

As an Insulation for Telegraph Cables and Electric Conductors GUTTA PERCHA has been universally adopted by all scientific and practical Electricians and Manufacturers of Telegraph Cables and Wires in this country and Europe, and has sustained, with increasing confidence in its superiority, the practical test of over twenty years' general use.

The PROPRIETOR *would say to all parties desiring*

SUBMARINE TELEGRAPH CABLES,

that he will guarantee to make and deliver at his Factory any style of Cable, Insulated with Gutta Percha, as low as they can IMPORT *Cable of the same style and quality.*

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AND

BLISS, TILLOTSON & CO.,

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have been appointed by me GENERAL AGENTS for the sale of any Telegraph Cable or Wire manufactured at the Works in New York, at Factory Prices, delivered in New York

JOHN THORNLEY, 503 Chestnut St., Philadelphia,

has been appointed Agent for the sale of any and all goods manufactured by me, at Factory Prices, delivered in New York.

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RUBBER CLOTHING CO., 347 Broadway,

A. D. & C. A. HODGMAN, 201 Broadway.

SAMUEL C. BISHOP,

OFFICE AT FACTORY.

TARIFF BUREAU.

Semi-Monthly Circular.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
June 1, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since May 15, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

180 Amherst, O.
* Alfred, Me.
* Ashland, Neb.
344 Alton Junction, Ill.
* Brunswick, Ga.
466 Baldwin City, Ks.
338 Bridgeport, Washington Co., Ill.
* Chestnut Hill, Pa.
339 Cobden, Ill.
377 Columbus Junction, Iowa.
410 Conway, Mo.
* Dalles, Minn.
* Duluth, Minn.
Ellis, Ks., tariff same as Hays City, Ks.
* Florida, N. Y.
* Fon du Lac, Minn.
21 Georgetown, Mass.
66 Hicks Ferry, Pa.
310 Henderson, Ky., heretofore on other line ofs.
* Hinckley, Minn.
* Hot Springs, Ark.
140 Harrisburgh, Pa.
271 Jonesboro, Ind., reopened.
377 Kossuth, Iowa.
396 Laporte, Iowa.
25 Millville, Mass.
329 Macanda, Ill.
338 Mascoutah, Ill.
310 Madisonville, Ky.
377 Morning Sun, Iowa.
* Pine Island, N. Y.
54 Princess Anne, Md., reopened.
142 Rockbridge Alum Springs Va., reopened.
* Rush City, Minn.
* Saccarappa, Me.
* South Bend, Neb.
67 Townsend, Del., reopened.
* Uniontown, Ky.
* White Bear Lake, Minn.
* Wyoming, Minn.
377 Wapella, Iowa.
271 Xenia, Ind., reopened.

Cozzens' Hotel, West Point, N. Y., and Norwood, or Norwood Hotel, N. J., summer offices, reopened. Check business for Cozzens' Hotel to West Point.

NEW OFFICES ON OTHER LINES.

	Tariff for other Lines.	*Leaves this Line.*
Alfred, Me.	25 1	Portland, Me.
Ashland, Neb.	50 3	Plattsmouth, Neb.
Brunswick, Ga.	50 5	Jessups, Ga.
Chestnut Hill, Pa.	20 2	Philadelphia.
Dalles, Minn.	70 5 more than St. Paul.	Same as St. Paul, Minn.
Duluth, Minn.	100 7 more than St. Paul	Same as St. Paul, Minn.
Florida, N. Y.	25 2 more than Goshen.	Same as Goshen, N. Y.
Fon du Lac, Minn.	90 6 more than St. Paul.	Same as St. Paul, Minn.
Hinckley, Minn.	50 3 more than St. Paul	Same as St. Paul, Minn.
Hot Springs, Ark.	75 5	Little Rock, Ark.,
Pine Island, N. Y.	25 2 more than Goshen	Same as Goshen, N. Y.
Rush City, Minn.	35 2 more than St. Paul.	Same as St. Paul, Minn.
Saccarappa, Me.	25 2	Portland, Me.
South Bend, Neb.	50 3	Plattsmouth, Neb.
Uniontown, Ky.	100 7	Louisville, Ky.
White Bear Lake, Minn.	25 2 more than St. Paul.	Same as St. Paul, Minn.
Wyoming, Minn.	30 2 more than St. Paul.	Same as St. Paul, Minn.

OFFICES CLOSED

Brush Creek, Mo.; Greenwood, Mo.; and Havanna, O.

GENERAL INFORMATION.

Amesbury and Amesbury Mills, Mass., are one and the same place. See "General Information" in Circular of May 1, 1870.

Business for Carmel, Me., should be checked to Bangor, Me.

Cumminsville, O., should be checked at same rate as Cincinnati, O. Special offices check at "special rate."

Venango, Pa., square 150, is in Crawford Co. Messages may be taken for Venango City, Venango Co., Pa., and sent and checked to Oil City, Pa. Tariff same as to Oil City.

The office heretofore known as Bergen City, N. J., will hereafter be known as Merton, N. J.

Offices when taking messages for Brooklyn, Williamsburgh, Astoria, Harlem, and Ft. Hamilton, N. Y., should be particular to charge, in addition to their rate to New York City, 15 and 1 for other lines, as given in the Tariff Book.

For Jamestown, Lebanon Co., Pa., in last JOURNAL, read Jonestown, &c.

OFFICES HAVING "SPECIAL SHEET A."

In computing tariff to points in Minn., named in list of "new offices on other lines," you will add the amounts "more than St. Paul" to your present "special rate" to that office. The rate for "this line" will be the same as that on business for St. Paul.

WILLIAM ORTON, President.

Journal of the Telegraph.

SABINE's work on the "Electric Telegraph" has been translated in Holland.

◆

GOVERNMENT has opened 126 new stations in Great Britain.

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ATLANTIC AND PACIFIC TELEGRAPH STOCK,

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Offer the best guaranty of excellence in their profession—in their long established business—in the extent and variety of their manufacturing facilities—in the many improvements introduced by them, now almost universally adopted or imitated—and in the extent of their business, domestic and foreign, enabling them to keep pace with telegraphic progress.

They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer.

Executive Order No. 102.

EXPRESS BUSINESS.

On and after May 1, 1870, all express matter forwarded for this Company by the American Merchants' Union and United States Express Companies, or by the Great Western and Merchants' and People's Dispatch Lines, will be *paid for at time of service.*

All express matter forwarded by the above-named Companies to or from the Treasurer, Auditor, Superintendent of Supplies, General Superintendent, or other officer at Headquarters, New York, will be paid for in New York. Packages passing between offices or employees and superintendents or supply agents will be paid for by the Superintendent or Supply Agent. All matter not otherwise provided for will be prepaid by the *sender.*

For all payments to express companies a detailed voucher must be taken, showing date, amount of charge, to and from whom, place from and to, and contents of package. This voucher must be returned with the monthly account current.

Attention of all superintendents, managers and agents is called particularly to the very large amounts heretofore paid for express service, and all employees are strictly enjoined to reduce express charges as much as possible, and in no case to forward matter by express which can be sent in some other way at less than one-half express rates.

Currency and coin must be sent by express, and checks, drafts and bills of exchange by mail as heretofore.

The monthly statements of express service called for by Executive Order No. 78, issued July 22, 1869, may be discontinued.

Vouchers given to express agents for tolls on messages sent by them must be signed in all cases by the Manager, in ink, and with his full name. The full amount receipted for must be written out by the Manager over his signature.

WILLIAM ORTON, President.

◆

Executive Order No. 103.

POSTAGE AND SPECIAL DELIVERY.

The attention of all superintendents and managers is called specially to Sections 10 and 83 of the New Book of Rules, to take effect May 1, 1870, under which all amounts received or paid for postage, or for special delivery, will be entered and checked, as for "other lines," as a part of the tariff upon the message, instead of by special entry in account current as heretofore.

For payments to other companies, and for special delivery, vouchers must be taken in all cases, and inclosed with account current.

WILLIAM ORTON, President.

◆

BEARDSTOWN STATION, Ill., May 24, 1870.

To the Editor of the Journal of the Telegraph :

Please notify your Sand Hill, Ill., correspondent that this line crosses the F. W. and W. wire this side of Chapin Depot, and that the line was crossed with F. W. and W. line the day he heard me trying to find a cross. Next time you hear from him give us his name. We have no M. on this line. Hoping to hear from you in next issue, I remain, yours very respectfully,

G. A. LEID, Manager.

BOSTON is discussing the lighting of its lamps by electricity.

◆

Two thousand iron telegraph poles have been landed in Peru for the Peruvian National Telegraph Company.

McKEE'S RAILROAD SIGNAL BOX.

All Signals connected with the Railroad service should be uniform, conspicuous, and ready to display at a moment's notice. Under the present system when an operator receives an order to detain a train, he has to take his flag, hunt a suitable place to stick it up, and keep running out every minute until the expected train arrives, to see that his flag or lantern don't get misplaced, or the view obstructed. More accidents occur from the proper signals not being shown than by any neglect on the part of operator or trainmen. The importance of having these Signals placed in a conspicuous position cannot be overestimated; it is the basis of all train dispatching by telegraph. This long needed improvement has been supplied in

"McKEE'S SIGNAL BOX,"

patented April 28, 1868, and February 8, 1870. This Box is in use on many roads, and all attest to its merits. Below we hand a few of the many letters we have received from railroad officials:

McKEE & CO,

GENTLEMEN: I am very happy to express the satisfaction that McKEE'S TELEGRAPH SIGNAL BOX has given since its adoption on this road and especially when, on riding over other roads, I see how superior our system of displaying Telegraph Signals is to that practiced elsewhere.

ROBERT HARRIS,
Gen'l Sup't C. B. & Q. R. R.,

MESSRS. McKEE & CO.

The SIGNAL BOX got up by Mr. William McKee has been in use on this road for the past year, and gives general satisfaction. The facility with which the flag or lamp can be displayed and the operator remain beside his instruments, its safety, simplicity, and durability, recommend it as an invaluable adjunct in working a railroad, and I cheerfully attest to its merits,

CHAS. R. PEDDLE,
Gen'l Sup't Terre Haute & I. R. R.

MR. McKEE.

DEAR SIR: I will say that your SIGNAL BOX has been adopted on this line of road, and gives entire satisfaction. I do not hesitate to recommend it as the best arrangement for the protection and display of Railway Signals I have yet seen.

J. C. McMULLEN,
Gen'l Sup't Chi., Alton & St. Louis R. R.

We have many other letters of a similar character.

We are now prepared to furnish any number of BOXES on short notice and reasonable terms, or will sell rights to companies to manufacture and use on their respective roads. The attention of R. R. Telegraph Superintendents is especially called and correspondence solicited.

McKEE & CO., Neponset, Illinois.

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TELEGRAPH AND ELECTRIC MATERIALS,

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SAMUEL C. BISHOP, OF NEW YORK,

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They are now prepared to fill promptly any orders for goods on hand, or to be manufactured, at Mr. BISHOP's prices in New York.

The long experience of Mr. BISHOP in the manufacture of

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INSULATED WIRES,

of various kinds, insulated with pure Gutta Percha, renders this arrangement a very important one for our numerous patrons throughout the country, and we confidently recommend these goods o their especial notice as being fully equal, if not superior, to any other in use.

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Gutta Percha Covered Telegraph Office Wires, in great variety of size and style.

Subterranean Wires, covered with Gutta Percha and Lead outside, various sizes.

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Subterranean Wires, with Fibre and Bishop's Patent Compound outside.

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Bridge's Patent Electric Cordage.

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Cotton and Silk-Covered Wires, both twist and braided.

This arrangement with Mr. BISHOP, together with our own extensive Manufactory in New York, and our great variety of Telegraph Material in stock, fully establish our claim that our stores are the depots of telegraph supplies in this country.

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The attention of Telegraph Companies and Builders is invited to the Compound Steel and Copper Wire manufactured by the

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has already been quite extensively introduced, and it is confidently believed, that by the natural laws of progression, is destined to supersede iron wire for Telegraphs, because of its superior working capacity under all conditions of weather.

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GREAT AND UNIFORM STRENGTH,

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MONTREAL,
QUEBEC,
PORTLAND,
ST. JOHN, N. B.,
HARTFORD,
TROY,
NEW HAVEN,
ROCHESTER,
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THE AMERICAN FIRE ALARM AND POLICE TELEGRAPH is covered by some twenty patents. Very early after its introduction into Boston, GAMEWELL & Co. purchased the original patents of FARMER & CHANNING, and during the past fifteen years have spared no expense or pains to improve and perfect this system.

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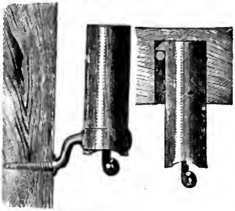

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JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 14. NEW YORK, JUNE 15, 1870. WHOLF NO. 63.

GOVERNMENT TELEGRAPHS.

ARGUMENT OF HON. WILLIAM ORTON, PRESIDENT WESTERN UNION TELEGRAPH COMPANY,

On the Bill to Establish Postal Telegraph Lines, Delivered before the Select Committee of the United States House of Representatives.

From a densely printed pamphlet of 53 pages, just placed in our hands, bearing the above caption, we select a couple of pages to answer inquiries made of us which these selections fully provide. They have value in being official, and from having been presented under circumstances which make them impressive. The interlocutory manner in which the whole argument is presented, the numerous questions asked, the occasional repartee, the sharp rejoinders, the pungent illustrations, render the pamphlet as readable as "Lothair," and as convincing as Euclid. We shall quote largely from it hereafter.

REDUCED RATES.

In reference to the large reductions of tariff made by the Company, Mr. Orton says:

"We claim credit for the Western Union Telegraph Company for some progress, from the fact that the Chairman of this Congressional Committee has not been able to keep up with it in regard to the reduction of its rates. At no time when statements have been published in regard to our rates, have they come within gunshot of the facts.

Mr. Washburn.—Those rates I obtained last summer, directly from the telegraph offices. I have no doubt but you have reduced the rates on many lines, and between many places, since then.

Mr. Orton.—I want you to admit that we have made a very general reduction. Such is the fact.

Mr. Washburn.—I certainly want to be accurate when I can. If you will furnish the Committee a table of your rates throughout the country we shall be very glad.

Mr. Orton.—I may say in this connection that the preparation of a table of tariff rates for a telegraph system to cover the United States, as that of the Western Union Telegraph Company does, is a work of immense magnitude. When you reflect for a moment that if there are five thousand offices, each separate office must have a separate tariff to each of the 4,999 other offices, you can see by simple multiplication what is involved in the preparation of such a tariff. The heterogeneous and confused list of tariff rates growing out of the old segregated system of lines, was one of the first obstacles sought to be overcome by the consolidation of the various lines in 1866, and one of the first duties undertaken after that consolidation was the preparation of a complete and consistent tariff system. It took the labor of from three to five men two years, and cost probably thirty thousand dollars. The foundation of the system is air-line distances. This system was put into operation on the 1st of October last. When that system went into operation, a very large reduction was made everywhere. In Texas and some portions of the South, the reduction was estimated at fully one-half.

You may obtain some idea of the amount of reduction when I tell you that the first month after that system went into operation, our revenues dropped $40,000. At this time, with ten thousand miles more of wire in operation than we had a year ago to-day, and two or three hundred more offices, making our expenses from $10,000 to $20,000 heavier, our receipts are $10,000 less per month. The estimated reduction by that tariff throughout the entire country was sixteen per cent. A few days ago, we made a calculation which will show the difference between our present rates and the old rates in a striking light. In January and February of this year, there was an increase in the number of messages sent by our lines of twelve per cent over the number sent during the corresponding months of last year; our expenses were increased eleven per cent and a fraction, while the difference against us in net receipts was over $200,000.

Mr. Washburn says, in reference to the average cost of sending messages:

> "To obtain the true average, they should have taken the rate of messages to the capital of each State from Washington, and then struck the average."

That plan involves a great fallacy. It could exhibit a true result only upon the condition that an *equal number* of dispatches were sent to every office in the United States. The correct way is, to divide the tolls by the whole number of dispatches actually sent. Suppose ninety-nine messages are sent from Washington to New York, while one is sent from Washington to Los Angelos, California. Would it be right to add together the cost of the one message to Los Angelos, and one to New York, and call that the average cost of all the dispatches sent to those two places?

Mr. Washburn.—But on the shorter lines you do a larger business, while on the longer lines but little business is done.

Mr. Orton.—I scarcely know what you mean by that remark. Do you desire to have it inferred that the price of transmission is all that enters into the question? In other words, that if you make the price low enough, messages enough will be sent to prevent diminution in the net receipts?

Mr. Washburn.—Oh! no, sir.

Mr. Orton.—I wish to say that, while, as a general rule, the number of messages will be increased by the reduction of rates, that rule is by no means universal; there are other elements to be taken into account. I can prove a reduction in the number of messages following a large reduction in the rate. I appeal to the statistics in reference to San Francisco. Under the former tariff, the expense of sending a ten-word message from New York to San Francisco was $7 85; the rate from San Francisco this way was the same in gold. We endeavored to adjust that inequality by reducing the cost of transmission from San Francisco to New York 35 per cent, that being at that time the premium on gold. The rate is now $5 from New York to San Francisco, and $4 in gold from San Francisco to New York, the adjustment being made on the basis of 20 per cent difference between gold and currency. Now, there are not so many messages sent at $4 as there formerly were at $7 85.

Mr. Washburn.—The reason of this is very apparent.

Mr. Orton.—It is very apparent to me.

Mr. Washburn.—The railroad has greatly decreased the time of mail communications between San Francisco and the East.

Mr. Orton.—I think that has very little to do with it. The trouble is, that business on the Pacific Coast is now very stagnant. They are going through a transition state, without knowing what is the matter with them. Telegraphic business should have been increased by the building of the Pacific Railway.

The fact is, the telegraph lives upon commerce. It is the nervous system of the commercial system. If you will sit down with me at my office for twenty minutes, I will show you what the condition of business is at any given time in any locality in the United States. After three years of careful study of the matter, I am ready to appeal to the telegraph receipts as a criterion under all circumstances.

This last year the grain business in the West has been very dull; as a consequence, the receipts from telegrams from that section have fallen off twenty-five per cent. Business in the South has been gaining a little month by month, for the last year or so; and now, the telegraphic receipts from that quarter give stronger indications of returning prosperity than at any previous time since the war.

COST OF BUILDING.

There is another statement that I desire to make, in reply to the challenge of the Chairman concerning the cost of the telegraph lines. In the report of the Western Union Telegraph Company, to which Mr. Washhurn refers in his speech, I was not discussing the subject of cost as a matter of any particular consequence, but rather to give information to my stockholders as to what had been done by the telegraph in Great Britain.

I stated that it was in evidence by Mr. Scudamore, who has been working up this subject in England, that the lines in England cost a certain sum per mile.

Well, now, see how easy it is for a man to be mistaken in a matter which he knows nothing about, and to forget one day what he said the day before. The Chairman, I infer, has addressed a letter to Mr.

Scudamore, to which the latter replied, "I am at a loss to understand how I can have been quoted as authority for the statement that a mile of English telegraph costs £143 15s."

I will now refer you to what he does say: I hold in my hand the parliamentary blue-book on the subject of the telegraph. I refer to the testimony of Mr. Scudamore, on page 149; he says, "I find that the [telegraph] companies have expended in construction somewhere about £2,200,000 or £2,300,000—I am not quite certain of the amount. I think it is probable that I am within the mark rather than over it."

On page 150 he states that the number of miles of line in operation was 16,000.

What I desired to show was, the average cost of telegraph lines. I simply took what Mr. Scudamore, under oath, declared that they cost in the aggregate, and divided that sum by the number of miles as set forth in Mr. Scudamore's statement. I am myself responsible for the arithmetical part of the calculation. As to the matter of fact—the aggregate cost and the total number of miles—I am not; I take those statements from Mr. Scudamore, and he is responsible for them. I shall therefore leave him to reconcile the discrepancies in his testimony before the parliamentary committee, and the statements in the letter to General Washburn, in whatever manner is most agreeable to himself.

Having impeached Mr. Sauer, it is perhaps not fair for me to cite him as authority; but we will at least see what he has to say about it. On page 140 of his book he states that the expenditure, computed per mile, stands as follows:

Per mile of line	$737 78
Per mile of wire	154 21

Mr. Washburn.—Does not Mr. Sauer state that this expenditure is largely made up of preliminary expenses and other matters outside of the actual cost of constructing a telegraph line?

Mr. Orton.—I am disposed to be entirely frank with the Committee; I must say, I have had too much to do to read through a great many of this kind of books.

Mr. Washburn.—State what the cost of constructing telegraph lines actually is?

Mr. Orton.—I should as soon undertake to state the cost of building houses. You might as well ask me what the houses in Washington cost.

Mr. Washburn.—Do you have your lines of telegraph built by contract?

Mr. Orton.—No, sir.

Mr. Washburn.—What is the average cost for a line of one wire?

Mr. Orton.—Where we have been building recently, the cost has been about $150 a mile. That is out West.

Mr. Lawrence.—Out on the plains and prairies, where timber is scarce and few facilities for transportation?

Mr. Orton.—No, sir; in Illinois, Iowa, etc.; and where the railroads haul the poles for us without charge.

Mr. Washburn.—That is not according to your former statement of the amount that had been expended for new lines.

Mr. Orton.—You will see again how an ounce of fact will sweeten a great deal of theory. Probably for every mile of telegraph built by us, a mile is built at the cost of the railway company. For every mile of poles put up, there are two miles of wire put up on the existing poles. These are advantages, and very important ones, which would not be possessed by the Government, should it enter upon the work of constructing and operating telegraph lines. Take the insulator we now use, not the best kind, perhaps, but the cheapest in the long run, and ordinary number eight wire, and the expense for wires and insulators will be about $50 per mile. But there is a good deal of expense that does not appear in that. A corporation starting anew and building its line before commencing to do business, would have all the expense of superintendence and executive control, in addition to the actual cost of putting up the poles and wires—expenses not necessary with an already organized company. As I have said before, I have not devoted any particular attention to the subject of cost, and in the report to which reference has been made I was not attempting to show the cost of constructing the telegraph lines, but simply to institute comparisons with reference to the value of our property—a subject upon which I have been much inquired of by our stockholders. I supposed then that there was no occasion to consider the value of our property, so far as our Government was concerned, for the reason that no proposition to buy the lines had at that time been submitted. The year preceding I had been combating the scheme then pending for the construction of telegraph lines by the Government.

PURCHASE BY GOVERNMENT.

Mr. Washburn.—The idea before this Committee is, that the Government should buy existing lines; consequently it is a matter of some importance for the Committee and for Congress to know how large an expenditure the Government would have to incur should it decide to carry out that project.

Mr. Orton.—In that connection I will say that, while we have accepted the provisions of the law of 1866; and therefore are estopped from making any objection to the purchase of the lines by the Government—further than such criticisms as every citizen has a right to make—we do not propose to be a party to a sale of our lines upon a basis which estimates the value of our property simply by so many thousand poles, and so many tons of wire. I do not admit that the cost of our lines or the value of our property is a proper subject of investigation by this Committee. Whenever Congress decides to purchase, we are entitled to select half the jury which is to decide the question of value. When that time arrives we shall claim that all our facilities, contracts, and franchises, as well as our poles, wire, and apparatus, shall be treated as property, and valued with reference to their united capacity to earn money.

I believe it would prove a great misfortune to the people of this country if the telegraph were taken from private hands, where it has been managed with such unparalleled success, and placed under the control of inexperienced governmental officials; but if the representatives of the people think otherwise, I trust they will examine the matter thoroughly, and adopt such precautionary measures as will insure its success.

The Western Union Telegraph Company alone possesses more miles of telegraph line than is contained in the whole of North Germany, Baden, Bavaria, Wurtemberg, Austria, Belgium, Denmark, Spain, Hungary, Italy, Norway, Holland, Portugal and Switzerland; and yet, enormous as is our extent of line—as these comparisons show—they would be totally inadequate to meet the wants of the country if the rates are reduced as provided for in the bill now under consideration.

If the Government takes the telegraph into its hands, and desires to make it a success, it must do one of two things: Either reduce the rates gradually, and provide additional wires and employees as the traffic increases, or, if the rates proposed in this bill are to be inaugurated at the outset, build 200,000 miles of additional line, and have them in readiness for operation when the Government tariff goes into effect. In either case, however, provision should be made for an outlay of at least $50,000,000 beyond the amount to be paid for the lines now existing, and for an annual deficit of not less than $10,000,000 per year in operating them.

GOVERNMENT GUARANTEE OF DIVIDEND.

Mr. Lawrence.—Would you be willing that Congress should pass a law saying that the Secretary of the Interior should fix a rate for transmitting messages at a price which would yield to your company a sufficient sum to make $1,600,000 of dividends, and to keep your lines in repair, and no greater amount?

Mr. Orton.—I should not be willing to make that stipulation.

Mr. Lawrence.—That would give you ten per cent.

Mr. Orton.—Yes, sir; upon Mr. Hubbard's estimate of the value of our property.

Mr. Lawrence.—That is your own estimate.

Mr. Orton.—No, sir; I simply took Mr. Hubbard's estimate, and turned it against himself, to show that, assuming it to be true, we were giving our stockholders no more than they were entitled to.

Mr. Washburn.—I understand you to say that you are earning ten per cent on sixteen millions?

Mr. Orton.—No; I said that we had tried to divide it; but we have passed one semi-annual dividend, and shall probably pass another.

Mr. Washburn.—How much could you have divided, and kept your lines in repair, without extensions?

Mr. Orton.—The answer to that question, you will see in a moment, involves several considerations. If we had not extended our lines, the effect of competition over that portion of the territory where we have active competition would undoubtedly have hampered our operations very much more than is apparent, in view of the fact that we have built more new lines every year than the opposition has built. We have been compensating for the loss by reduction of rates and division of business with our competitors, by the extension of our lines into a section of country where the opposition does not come. Therefore, if we had not extended any, what the result would have been it is not easy to predict. If you ask what would have been the result if there had been no competition, and we had made no extensions, I should say that we could have divided about five per cent upon the forty millions—possibly a little more.

Mr. Washburn.—What proportion of the lines are owned and controlled by your Company in the United States.

Mr. Orton.—I should say 90 per cent, approximately.

Mr. Washburn.—I think I understood from you in a remark the other day, that most of these opposition companies are not earning money; that some of them were on their last legs, and must either go out of sight or be absorbed by your Company.

Mr. Orton.—There is no sort of doubt but what every so-called opposition line in the United States is losing money—some of them more than others.

Mr. Washburn.—And sooner or later will be wound up?

Mr. Orton.—As to what the result will ultimately be, it is, and it is not, difficult to predict. When those companies have planted a pole by the side of every one of ours, and have duplicated every wire of ours thereon, and have opened a station by the side of ours in every place where we have one now, we are then in precisely this situation: they have more than multiplied the expense of doing the business by two, and if we assume that they get half of it, have divided the receipts by two. There is no business in the world that can stand that test. Now, somebody has got to break.

Mr. Washburn.—You have no idea that these companies are going on to multiply lines alongside of yours to the extent you name.

Mr. Orton.—No; but they are going to add more to them.

Mr. Washburn.—That is, between profitable and important points?

Mr. Orton.—There is a great deal of error on this subject of profitable points. Unprofitable points are just as necessary to telegraph companies as profitable points are.

Mr. Davis.—But these opposition lines are built mostly between what are called profitable points?

Mr. Orton.—Yes, sir; entirely between what are so considered.

Mr. Washburn.—I inferred that these opposition lines must go, sooner or later, to the wall.

Mr. Orton.—If that is true, doesn't it prove too much? The tendency of these competing lines is to reduce the rates, and increase the expenses unnecessarily. There is no doubt of that. But that is a private loss: that does not concern the Government; and so long as the public derive the advantage of the lower rate which competition gives, it seems to me that there is nobody to complain except the unfortunate stockholders.

Mr. Washburn.—That is all true; but if, eventnally, this is to be the result, that you are to absorb all the lines, and that these other lines must give up as competing lines, the telegraph will be practically in your hands; and I understand you to say that there is no earthly power that can interfere with your right to charge what you please. When you shall control all the telegraph lines you may charge five dollars for a message to New York from here, as well as twenty-five cents, if it should suit you to do so.

Mr. Orton.—I think you add a good deal of unnecessary emphasis to the statement I made. I do not wish to be understood as saying that there is no earthly power to control us; on the contrary, I distinctly admitted that the *power* was there, but I claimed that Congress had no right to exercise it as things now stood. Well, sir, suppose, for the purpose of the argument, that I had made the statement, in the broadest possible form, and then let me ask you, what of it? What power have you over the railway? You pay two dollars for a hard bed to sleep on from Washington to New York, in addition to eight dollars fare, but a competing railway cannot be established between these points unless the authority to provide it is vested here. Now, then, the moment the Western Union, or any other telegraph company, should undertake to pursue the policy suggested by your remark, a few thousand dollars would build a new line between New York and Washington, and, like the gimlet hole in the hogshead, tap the business, and compel us to come to the lowest rates fixed by that little concern. There is no business in the United States so secure, so far as the public is concerned, against oppressive exactions, as that of the telegraph—because it is so easy to provide competition against it; and that competition will come just as soon as unreasonable profits are being earned.

Mr. Washburn.—Wouldn't the effect be that the moment that competition was put on, that you would put the prices down on that particular line and crush it out?

Mr. Orton.—I am very much obliged to you for asking that question, because it gives me the opportunity to say that the Western Union Company has never reduced its rates upon a competitor. I ask you to accept that declaration as a fact, and to give us all due credit for it. The Western Union Company has simply attended to its own legitimate business, but when its competitors have attacked its rates we have not always permitted them to fix them for us. When they cut the rates on us we do not always accept them. But the facts are precisely as I state them to you.

Mr. Washburn.—When an opposition is started and does not cut under your rates you do not cut under theirs?

Mr. Orton.—No, sir; we have never done it since my connection with the business.

GUARANTEE ON A CASH VALUATION.

Mr. Washburn.—If the Government would guarantee you 10 per cent on the cash value of your lines, and take the risk of loss, would you undertake to send messages at a uniform rate throughout the country for 20 cents?

Mr. Orton.—Yes, sir. That is substantially the proposition I make.

Mr. Washburn.—Would you be willing to take the value of your stock in the stock market as a basis?

Mr. Orton.—I would not. The quotations of the stock market seldom give the true value of the property of any corporation. The present price of our stock in the market is about 33—the par value being 100. I hold a little, however, for which I paid, more than three years ago, 58. Since that time we have expended, in enlarging and improving our property, more than three millions of dollars in cash, taken from current earnings. Intrinsically, therefore, our property is worth three millions more when its stock is selling at 33 than when it sold at 58. It is probable that, had we divided the three millions among our stockholders the price of the stock would be much higher to-day than it is, although it would be actually worth considerably less. You will see by this illustration how unjust it would be to ask our stockholders, a majority of whom have paid very much more for their stock than it will now bring in the market, to abandon all expectation of ever getting their investment returned in full, as well as all hope of any future profit.

THE GOVERNMENT BILL PREFERRED.

Mr. Washburn.—I understand that if either of these bills should pass, you would prefer the Government should have the entire control to this partnership arrangement?

Mr. Orton.—If I spoke simply from selfish and speculative motives, I should say that I had rather Mr. Hubbard's bill would pass; because, with my opportunities and experience, I can see where I could make a good deal of money for myself. But standing here as a citizen claiming a little patriotism, I say unhesitatingly to the Government, make your contributions in the way of protection and immunity from taxation and annoyances open and free to all companies, or take the whole business to yourself and control it. In my judgment there is no middle ground. Leave it either to private competition, with such protection as you can give in exchange for the right to exercise a certain control of the companies (they would certainly concede the right for you to control their tariffs), or else acquire the property by fair, legitimate ascertainment of its value, and then take the business entirely in your hands—one or the other.

WHAT THE WESTERN UNION LINES EARN.

Mr. Lawrence.—If you take the sum of money divided to your stockholders in dividends for the last three years, and add to it the money invested in new lines and improvements on old ones, not including mere repairs, what would be the percentum of the gross sum on a capital of forty millions?

Mr. Orton.—About six per cent. Probably a little less.

Batteries.

There exists much room for the improvement of both batteries and apparatus in regard to simplicity of arrangement. Our modern form of batteries have forced themselves upon us on the grounds of successive improvements in regard to diminished size, with increase of power, but attended with great increase in cost, not only in regard to the element themselves, but also in regard to actual working.

Indeed, the present means of affording electromotive forces have their analogies with the early forms of the steam engine. In the latter the amount of coal required to get a horse-power was something enormous, only a few years ago, compared to what is attained at the present day. But by a careful study of the construction of the engine, successive improvements arise, until the perfection of the modern machine was arrived at.

We may hope precisely the same results to accrue in regard to Voltaic cells employed for telegraphic purposes.

The professional electrician is fully aware that we get only a fraction of the electricity, which any modern form of the Voltaic battery may afford.

The resistance inside and outside the cells enormously lessens the potency of our best arrangements, and until this difficulty is overcome we must be content with results that are necessarily in amount far below those we require. It must be borne in mind, however, that the science of electricity is still comparatively but partially developed, and that more attention has been paid to the construction of telegraphic apparatus than to the improvement of our sources of the Voltaic current. In this latter field there exists a scope for experiment in which many of our readers might profitably exercise their scientific ingenuity.—*Electric Telegraph Review.*

Great Britain.

London, June 6—Noon.

The weather to-day is warm and delightful.

The Irish telegraph lines are not working well to-day. At present it is impossible to communicate with Valentia, the point where the land lines connect with the English cable. As a consequence, telegrams from English cities for the United States are going forward by the following somewhat circuitous route: By Channel cable to Brest, thence by French cable to St. Pierre, thence by Newfoundland Company's cable to Sidney, C. B.; thence by Newfoundland land line to Port Hood, and thence by the Western Union lines to the various cities and towns in the United States and Canada.

Notwithstanding this unusual route, there is no apparent delay in the transmission of messages. The working of the lines in this way demonstrates the wisdom and practical value of the joint purse arrangement, made by the English and French Cable Companies some time since. In the absence of some such arrangemennt America would not be in telegraphic communication with Europe to-day, because the lines of both companies are disordered.

The English line is crippled from Valentia east, and the French line from St. Pierre west; but by jumping from one cable to another, as it were, in mid ocean, telegraphic communication is restored.

◆

A cable from Falmouth to Lisbon has been laid and will be extended to Malta.

◆

The Papal Government has established a strict censorship over the telegraph.

[For the Journal of the Telegraph.]

UNDERGROUND TELEGRAPH LINES.

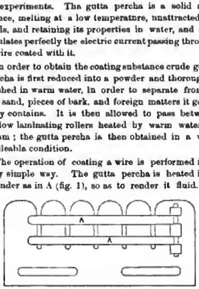
By C. Widemann.

The telegraph lines suspended on poles do not at first sight present all the required conditions of security. The wires and their supports are exposed to all mischievous persons, and the communication can be interrupted with the greatest facility. Sudden changes in temperature and accidents are constantly occurring by which the wires are broken. It has been tried to protect the wires from all external injury by surrounding them with an insulating compound and in placing them in underground conducts. The first attempts of this kind made with *caout-chouc* (india rubber) coated wires were not successful.

The discovery of gutta percha has led to a new series of experiments. Tha gutta percha is a solid substance, melting at a low temperature, unattracted by acids, and retaining its properties in water, and also insulates perfectly the electric current passing through a wire coated with it.

In order to obtain the coating substance crude gutta percha is first reduced into a powder and thoroughly washed in warm water, in order to separate from it the sand, pieces of bark, and foreign matters it generally contains. It is then allowed to pass between hollow laminating rollers heated by warm water or steam ; the gutta percha is then obtained in a very malleabla condition.

The operation of coating a wire is performed in a very simple way. The gutta percha is heated in a cylinder as in A (fig. 1), so as to render it fluid. A piston then presses it vigorously, and the gutta percha raises in a little tube in which the wire to be coated passes ; it adheres to it, and the wire, which is drawn by its upper end, is thus coated by the gutta percha. To test a wire coated with any substance and test the insulating properties of the said substance, and also to ascertain if the coating has no solution of continuity so as to prevent any loss of electrical current, the portion to be tested is dipped in a wooden barrel or tank containing acidulated water, while the other extremity of the wire is put in contact with one of the poles of an electrical battery. The second pole of the battery communicates through the medium of a galvanometer to a copper sheet which is dipped in the liquid contained in the barrel. If the current is established, it can only be produced by a contact betweeu the encased copper wire and the acidulated water, and in consequence of a fault in the envelope or its insulating properties.



When it is desired to join two covered wires, they are denuded at their extremities ; the two wires are then twisted together and coated with gutta percha sheets heated over a small alcohol lamp. The thickness to be given to the gutta percha coating depends entirely on the application which is to be made of the coated wire.

The wires used for underground communication receive generally two coatings ; the first of pure gutta percha, and the second composed of gutta percha vulcanized. Vulcanized gutta percha cannot be put directly in contact with the copper wires, on account of the sulphuret of copper therein.

Sometimes these wires are coated with a leaden pipe or sheet in order to increase their durability and protect them against insects.

In establishing an underground line, a trench was opened a yard in depth, and the wires coated with gutta percha were laid between two small layers of sand of .10 m. thickness. The wires were sometimes placed in a stoneware or clay pipe, sometimes in a wooden case. Manholes were established at suitable distances to facilitate researches in case of disturbances occurring in the conductibility of the wires. These were built with bricks, and were traversed by a wooden pole placed horizontally, around which the wires passed, thus allowing an opportunity to cut them if found necessary.

A peculiar decomposition of the organic matter of the gutta percha, however, soon takes place, and after three years there is an escape of the electrical currents of such importance as to interrupt communication. In Prussia nearly all the lines had been established on this system, and had to be superseded by the ordinary suspended lines.

In France, also, underground lines had been established to pass through some cities on this system, and have also been abandoned. Even the wires covered with a lead sheet have not given any better results.

It is then useless to think of establishing underground lines, coated with gutta percha, even in admitting that a composition in which gutta percha might enter would increase their durability. It is doubtful, also, if the suspended lines system will ever be abandoned when distant points are to be reached. The expenses of inspection and repair are offset by the economy of their construction. It is also easy to increase the number of transmitting wires and their supports, and, in case of their getting out of order, repairs are effected with very little cost ; whereas, in underground lines, the researches to discover derangements are long and costly ; and the return currents being very strong the transmission is slow and less regular.

But for a metropolitan or city telegraph, the conditions are different. The telegraph poles are unsightly and the wires dangerous. In case of riots, they naturally attract attention and cannot be easily protected. Under such circumstances there is a decided advantage in burying the wires, whatever may be the expense.

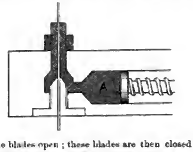
M. Saigay, General Telegraph Inspector of France, has made a report from which the following is an extract :

"The French Telegraph Administration has decided to establish its city wires in a trench of a sufficient depth, and cover these with a bituminous compound, in order to form a block of a desirabla consistency. This bituminous compound possesses all insulating properties, and its price is low."

It was necessary that the wires laid in such a way should be at convenient distances from each other, and also that a not too large quantity of the bituminous compound should be used.

On the other hand, in placing them too near each other, it was feared that these wires, dilated by the heat at the moment of their laying in the hot bituminous compound, would in cooling and contracting come in contact with each other or with the ground. The copper wires laid under M. Gaillau's system were objectionable on this account. If the compound used had had the property of cooling instantly, it would only have been necessary to pour the melted compound at different points, the wires being separated on a rake, but the solidification of the bituminous compound requiring several hours, the rake system was not applicable.

Trials have been made at the Baudouin Brothers' Bitumen Works, at Montrouge, France. First it was tried to place along the wires, at suitable distances, small insulating guides made of an insulating body, as porcelain clay, in order to maintain the wires in their respective positions, and not to allow them any motion. But these foreign bodies inclosed in the bitumen compromised its solidity and homogeneity. It was also tried to use bitumen guides, manufactured and laid in advance, but they melted in coming in contact with the hot bituminous compound, and did not answer the object. The following ingenious disposition was then at last adopted. The telegraph wires being stretched in the desired numbers, are then fastened at short distances (25 centimeters) by the means of cast iron combs (fig. II). On one of their sides these combs bear blades VV, which are able to move horizontally around C ; the comb is introduced from top to bottom between the wires, having the blades open ; these blades are then closed in order to separate the horizontal rows of wires.



Along the wires are then arranged wooden ribs or sides. Sections of 25 centimeters in length are thus formed. The hot bituminous compound is then poured in in alternate sections. As soon as the compound has become hard the iron combs are removed, and thus a series of bituminous blocks are obtained of 25 centimeters each, and separated by intervals of 25 centimeters, in which intervals the wires are free and equally separated. The bituminous composition is then poured in these intervals. The bitumen cement of the first layer is sufficiently healed at its extremities to solder itself to the bitumen which is now poured in, but remains cold in the middle and maintains the free space between the wires, and insures their separation. A homogeneous block is thus obtained, in which all the wires are regularly disposed. The wires used are of iron. They are of a large diameter to facilitate transmission. They are generally galvanized, although the bitumen has no action whatever on iron, but in order that they may be laid clean and free from rust.

The bituminous cement is composed as follows : First, cakes are made of

Ground, Seyssel or Travers asphaltum............	100 kilog
Refined bitumen of Basteunes, an average of....	8 kilog

These 108 kilog are reduced to 102 in preparing. The mixture is placed in a boiler, stirred, poured out into molds and cooled. These molded cakes are then brought to the place where the line is to be laid and submitted to tha following preparation :

Of the cakes..	100 kilog
Bitumen of Basteunes..............................	4 kilog
Well washed and dried gravel....................	80 kilog

In these preparations the cement is thin enough to flow freely and perfectly around the wires, and becomes hard in cooling, and retains sufficient elasticity so as not to be easily brokan by outside shocks.

The gravel to be added to tha mixture has to be very fine, and entirely deprived of earthy matters, as these with the bitumen would become charred in the boiler, and this charred compound would interfere with the conductibility of the wires. In order to facilitate researches in case of interruptions, the wires are placed over each other in rows of ten, six, or four

The intermediate spaces between the wires are 27 millimeters.

The space separating them in the lines composed of four wires is larger, as it was necessary to obtain a little larger section so as to have sufficient resistance; the intermediate space is of 4 centimeters; the vertical space of 3 centimeters; the wires are laid at a distance of three centimeters from the bottom, and at the same distance from the sides. It has been found, by experience, that in order to avoid slight connections with the wires it was necessary to increase the horizontal and the inferior distance between the wires; the figure 11 shows a comb arranged for a line of 10 wires, and are made on the same principle for any number of wires.

These preliminaries established, the work is done as follows:

At the bottom of the trench a layer of fine and dry sand is first placed; the wires are then fixed to a stationary point—for example, a post strongly planted in the ground, but as the work progresses the wires are naturally held by the portion already set in the bituminous cement.

They are then stretched one by one in lengths of 60 to 80 meters, in the following easy manner: At the starting point is a board of oak, square, and of the width of the trench. This board is provided with hooks in which a vise or clamp is fixed. At the back of the board an iron hook is firmly fastened in the ground, to which hook a pair of pulleys are attached, and to these another vise or clamp. In the teeth of this vise the wire to be stretched is inserted. The rope working the pulleys is then drawn, and the wire brought to its desired tension, is then held firmly by the clamp or vise; all the wires are thus successively attached to the board.

The bundles of wire do not generally possess a length above 200 meters; it is therefore often necessary to join the two ends of the wires. This operation is done thus: The two extremities of the wires are hammered flat about 5 centimeters in length; they are then brought in contact and joined together with a smaller wire, and are then welded with a little chlorohydrate of ammonia in which zinc has been dissolved. On the two iron wires some melted tin is then poured, and by this solder the two wires are joined.

As soon as the wires are stretched, a layer of thick paper is placed under them (old newspapers answer the purpose) in order to obtain a smoother surface under the bituminous cement. The combs are then placed in the manner already described. Along the wires boards are placed which form the lateral sides. If a number of telegraph lines are put in the same trench, the same board separates them. These boards have been previously wrapped in thick paper in order to prevent them from adhering to the bitumen. Their length is of two meters; thickness, two centimeters; height, 10 centimeters. They are provided at each extremity with small holes, and are connected by means of a smaller board with two wooden pins, in order to maintain the distance equal on the line.

When these arrangements have been made, the bitumen is poured in the first case or section. In the first attempt, in order to watch the disposition of the wires, the bitumen was poured in layers which were allowed to cool successively—one layer up to the level of the wires, one over the wires, and at last a smaller and last layer to finish. But these successive layers did not solder themselves to each other in a perfect way in consequence of their thinness—the cold bitumen layer was not heated sufficiently—also by dampness or dust that sometimes interfered during the operation.

The evil disappeared as soon as the bitumen was poured at once and filling the entire section. Two hours after the first filling of the first section, the combs are removed, and immediately the other sections are filled in a similar manner. The wooden rollers are then removed, fine earth is then placed over the whole, and the trench is refilled.

These trenches have 1 meter 30 centimeters depth at an average, and about 90 centimeters width, when one block only has to be laid. It is necessary to have a convenient depth in order to avoid the cracking of the bitumen by the shocks which might be communicated to it by the passage of carriages or heavy loaded cars.

The depth of the trench has also another advantage in protecting the line from the changes in temperature, and all atmospheric changes.

We give further the cost by meters of a line of ten, six, and four wires, not reckoning the expense of the trench:

	—Telegraph Lines— Of 10 Wires. f. c.	Of 6 Wires. f. c.	Of 4 Wires. f. c.
Bitumen cement used at 11fr. 80c. the 100 kilog.	3 80	2 65	2 57
Transportation of the compound, 5 per cent of the cement used	0 19	0 13	0 13
Fuel, 11 per cent of the compound used	0 42	0 29	0 28
Iron wire of .004 meter diameter, at 76c. the meter	0 76	0 46	0 30
Sand	0 11	0 11	0 11
Paper and nails	0 07	0 07	0 07
Labor	1 04	0 80	0 64
Tools (wear)	0 26	0 26	0 26
	6 65	4 77	4 42

These figures, established for an experimental line, would be much reduced if applied on a large scale. The bitumen composition could be used of an inferior quality and price to that mentioned in this article.

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[From the Scientific American.]

RECENT ADVANCES IN ELECTRIC SCIENCE.

By C. Widemann.

NEY ELECTRIC BATTERY.

This battery is composed of a vessel containing hydrochlorate of ammonia in saturated solution with an amalgamated zinc plate plunged therein; also a porous cup filled with carbonate of copper having a copper plate plunged into it.

This new battery can be established at little cost, and in order to maintain its power, it needs only a few pieces of sal ammonia added from time to time.

The carbonate of copper is insoluble in the solution of hydrochlorate of ammonia; but in closing the circuit the hydrochlorate of ammonia decomposes into hydrochloric acid and ammonia, the first going to the zinc pole, and the other to the copper pole; the carbonate of copper becomes then soluble, and its solubility produces a secondary current of the power of a Daniell's battery.

For military telegraphic purposes, in order to render this battery transportable, the solution of sal ammonia can be replaced by sand impregnated with the same solution.

DEVO'S NEW ELECTRIC BATTERY.

This very simple battery has been quite lately adopted by the Belgian telegraphic administration to work on an important line; it consists in a cylindric vessel divided into two parts by means of a piece of gas carbon. In one of the parts a mixture of pulverized sal ammonia and coke is placed, and in the other part a zinc plate.

This battery is set in operation by adding pure water to the two compartments; the zinc decomposes the ammoniacal solution to form chloride of zinc. The positive pole corresponds to the graphic blade, and the negative to the zinc blade.

This battery is more powerful than the sulphate of copper battery.

SECONDARY BATTERY OF GASTON PLAUTE.

When the two metallic plates which have been used to decompose water by a battery are joined together by a conductor, a secondary current is obtained, called the current of polarization.

The intensity of this current varies according to the substance of which the plates are made, and its maximum action takes place when leaden plates are used.

This last property has been discovered by Mr. Gaston Plante, who has constructed a battery in which he takes advantage of this polarization current.

A gutta percha cup of a parallelopipedic form, contains six lead plates, separated from each other by a free space, and the even numbered plates are put into communication with one of the conductors, and the odd numbered plates with the other conductor. The gutta percha cup contains water acidulated by sulphuric acid.

In attaching to the two conductors the heophores of a small Bunsen battery, the current passes through the acidulated water and decomposes it. The posi- leaden blades, where the oxygen is sent, are very soon coated with binoxide of lead. This latter having a great tendency to decompose water by its avidity for hydrogen, which action is the reverse of the electrolytic action, it happens then very soon that the decomposition of the water into its two elements, hydrogen and oxygen, ceases very rapidly.

Then suppressing the Bunsen battery and rejoining the conductors to which the two systems of lead blades are attached, a current of a larger intensity than the one formerly used is obtained.

In using two lead electrodes having a double surface of 2 square meters, Mr. Plante has obtained similar results to those produced by 70 Bunsen cups of 8 inches in height.

With the six leaden blades (having a dimension of about 20 to 22 centimeters) of the battery we have just described, a large steel knitting needle is melted by having this polarization current passed through it.

To obtain results of quantity and tension as desired, Mr. Plante disposes near each other 40 gutta percha cups, containing the acidulated water, in which 20 lead plates, about 7¼ inches square, are dipped. These blades are joined as above described by even and odd numbers, and the battery is worked as described to obtain results of quantity; but to obtain results of tension a peculiar commutator is used, joining together the lead blades in the following order: No. 2 with 3; No. 4 with 5; No. 6 with 7, etc.

In joining the two extremes, a current capable of an enormous resistance is obtained, enabling a platina wire of two meters in length and ¼ of millimeter diameter to be brought to a red heat. An iron wire burns immediately, and an intense light is obtained from a metallic point over a surface of mercury; also in putting in contact two carbon points.

As it has been seen, this secondary battery is to the battery which charges it what the Leyden jar is to the ordinary electric machine.

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June 1, 1870.

To the Editor of the Journal of the Telegraph.

Dear Sir: Are operators in intermediate stations obliged to come to office at any hour outside of office hours (if called upon) to send any kind of commercial, business, or death messages? Please answer through your next and oblige "Down East."

[No one is under compulsion to perform service beyond regular office hours except to receive or forward retarded business. But no right-minded man will refuse to serve any one in positive need of the wires to relieve him from difficulty or to assuage distress. Respecting such duties there can be no rules given. Good common sense and a proper sympathy with the necessities of others will always decide what should be done in such cases.—Ed.]

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, JUNE 15, 1870.

A PEEP INTO THE FUTURE.

A PNEUMATIC TUBE OVER FOUR HUNDRED MILES LONG—SEVENTEEN SECONDS FROM LONDON TO GLASGOW.

The following extract from a letter received by one of our friends describes the operation of a pneumatic tube between Glasgow and London. Probably few of our readers are aware of the existence of the process by which messages and packages are almost instantaneously transmitted between these two cities:

"I had occasion to send a telegram to London the other day, and in a few minutes received a reply which led me to suppose that a serious error had been committed by my agents, involving many thousand pounds. I immediately went to the telegraph office and asked to see my message. The clerk said, "We can't show it to you, as we have sent it to London.' 'But,' I replied, 'You must have my original paper here; I wish to see that.' He again said, 'No, we have not got it; it is in the Post-Office at London.' 'What do you mean?' I asked, 'Pray let me see the paper I left here half an hour ago.' 'Well,' said he 'if you must see it, we will get it back in a few minutes, but it is now in London.' He rang a bell, and in five minutes or so produced my message, rolled up in pasteboard.

"It seems that for some months there has existed a pneumatic telegraph betwixt Glasgow and London and betwixt London and the other principal cities of the kingdom, which consists of an iron tube, into which the messages are thrown and sent to their destination. I inquired if I might see a message sent. 'Oh, yes; come round here.' He slipped a number of messages into the pasteboard scroll, popped it into the tube, and made a signal. I put my ear to the tube and heard a slight rumbling noise for seventeen seconds, when a bell rang beside me, indicating that the scroll had arrived at the General Post-Office, 400 miles off! It almost took my breath away to think of it. If I could only go to Boston with the same relative speed, you might count on my passing an evening every week at 124 Beacon street, and returning home to sleep. Who knows but we may be conveyed in this marvelous manner before many years?

"Perhaps you are aware that there has been a large tube between the General Post-Office in London and the station in Eustace Square in operation for a number of years. The mail bags for the north are all sent by this conveyance, so that the Post-Office receives letters up to a few minutes before the train leaves, three miles off. The transit takes less than two seconds! Surely this is an age of wonders."—*Boston Transcript.*

We print the above as we find it. It is respectably introduced but evidently false. We do not believe the writer ever witnessed the performance he narrates, or, if any exhibition was made to him similar to what he describes, that it was real. He has either been imposed upon or he has imposed upon the Boston editor. Such a possibility of course is marvelous in Boston. Yet stranger things have been written there. Only one other thing is possible, and that, of course, we unwillingly acknowledge. We ourselves may be ignorant and incredulous of a great fact.

1. Here is a gentleman who takes a message of great importance to the Government Telegraph Office. It is presumably of usual length. At the average rate of English transmission it would occupy 1¼ minutes. It has been sent and answered. An error is suspected and a request made to see the original message. It cannot be acceded to because the original has gone to where the translation was delivered, 400 miles away. How? By pneumatic tube. In what time? Seventeen seconds! or in one-fifth of the time it took the message to go by wire!

Now we submit that this is arrant nonsense. If a message can be sent tied to a piece of pasteboard twenty-five miles a second with a single puff of wind five times faster than by wire, without the risks of error, without the labor of manipulation, without exposure of its contents, and by a channel which the original must take according to the strange narrative of the *Transcript*, what, we ask, in all honesty, is the use of the telegraph at all? Every one will of course see in such a possibility to transmit a letter unbroken, unopened, unabraviated, by a single spurt of a bellows or the suck of an engine, at the rate of 400 miles in 17 seconds, an agency far in advance of the telegraph itself. No telegraph could compete with it. A letter of a dozen pages sealed and addressed could be puffed from London to Liverpool while an operator was giving the first wiggle of his key.

2. But here comes in the little joker. The original is wanted. It is 400 miles off. It has to be sent for. How shall it be got? Not, it seems, by a message over the wires. Not by sending a request by the wind line in a pasteboard scroll. How then? By ringing a bell! We are not told whether it was Seward's little bell, or the town bell, or a call bell, or how it was rung or where it was. Only this and nothing more. A bell was rung; it was heard 400 miles off, and apparently understood, and a package was received in five minutes with the article wanted! And we are asked to believe this! How can we? It reads like the veriest nonsense. Yet we may be displaying an enormous ignorance and incredulity.

Then the inquiring writer desires to see the thing done. The official is wondrously obliging. Of course it can be seen. A pack of messages conveniently on hand for the purpose are clapped into a pasteboard scroll, popped into a tube, a signal is given, and this pasteboard carriage is distinctly heard all the way to London during its 17 seconds' journey through a 400 miles tunnel, which it announces performed by ringing a bell. The ringing of a bell by the agency of a wire we can easily conceive, but, shade of Tyndall, when was sound invented to travel at such a speed or so far!

Then, again, we ask, if it be true that Government has this wondrous agency of tubes connecting her great cities—by which even the mails might be sent—why the outcry of her whole people at the mismanagement and delay of her telegraphs which the tubes might have been used to supercede? Why did Glasgow merchants meet at their exchange and denounce the tardiness and incorrectness of the wires, and editors complain of deprivation of news, if such an agency was in existence and ready for employment? We must be excused by the *Boston Transcript* if we write down the whole thing as bosh. It bears no evidence of truth.

Of the use of pneumatic tubes in London, we are aware. The tube between the General Post-Office and Eustace Square is a veritable and eminently useful reality. Various auxiliary telegraph offices in London connect with the central office in this manner. It may be that in some future day mail balls may fly unseen at 25 miles a second between great proximate commercial centres, leaving the laggard wires unused, but we submit that that time has not yet come. The article in the *Transcript* is properly headed:

"A Peep into the Future."

It certainly must be a very distant future in America.

* * *

The Morse Testimonial.

The Morse Testimonial Fund is gradually enlarging, and the work is going on steadily in many parts of the country. Let no one think we are troubled by any adverse criticisms, except to profit by them. We believe the Testimonial is a thought which any man might feel a just pride in originating, and which our pride will be to aid. Let no man send a dollar who does not feel it to be a pleasure and a duty. Let all engaged in the canvass make it absolutely free. We trust enough may yet be received to justify the erection of an iron monument in Central Park, which, by the earth's action, may become a perpetual magnet. See acknowledgments on another page.

* * *

A Secondary Battery.

At Sir Edward Sabine's *conversazione*, referred to in our last, Mr. J. Parnell exhibited a battery which to us is new. It has 40 cells, each containing a pair of copper plates immersed in a solution of soda. By this employment of an alkali, the electromotive force produced is supposed to depend on the electrolytic reduction of the sodium. The battery is arranged in ten compound cells of four couples each, and is charged by a small battery of five Grove cells. After the connection has been established a few seconds a commutator or switch is brought into use, and excites the whole forty cells into activity. It is thought that a battery so constructed, which can be energized at pleasure by a brief communication with a small Grove, will be found of service in telegraphing through lines of great resistance.

* * *

Congress has ordered an investigation into the tariffs of the International Ocean Cable Company.

* * *

Curious.—The passing of the W. U. Dividend sent stock up two per cent.

* * *

The Anglo-American repair ship "Robert Lowe" is nearly ready.

* * *

An announcement of the loss of the "Dacia" with the cable to connect the West India Islands with Cuba and the United States, has been found to have been based on a fraudulent dispatch.

* * *

Gen. O. H. Palmer, Treasurer Western Union Telegraph Company, leaves to day on the "Nebraska" with his family for Europe, to be absent until September.

* * *

The wisdom of the recent arrangement for the joint working of the Atlantic cables is seen in the ability to keep up unbroken communication, although all the cables are at some point or other disabled.

THE TELEGRAPH IN| SWITZERLAND.

We have received the Official Report of the Swiss Telegraph Administration for 1869, from which we make the following abstract:

EXPENDITURES.

Salaries and commissions	$119.848 18
Traveling expenses	3.282 36
Office expenses	12,800 14
Rent	7,400 03
Construction and repairs of lines	50.242 26
Apparatus	17,997 16
Furniture	1,653 35
Sundries	1,427 35
	$214,240 83
Telegraph receipts	197,132 32
Loss	$17,108 51

In the tabular statement the figures are manipulated so as to show, instead of a loss of $17,108 51, an apparent profit of $26,049 30. The process by which this result is attained was accomplished by adding to the receipts $13,137 82, which were mainly derived from forced contributions from communities for the establishment of offices, and by deducting from the expenditures $29,620 which were disbursed in new constructions.

On page 2 of the Official Report it is stated that only $11,144 of the sum placed to the credit of the Administration of Telegraphs by the decree of the 17th July, 1867, remains unexpended. The disbursements upon account of this credit were as follows;

In 1867	$42,277 00
In 1868	16,959 00
In 1869	29,620 00
Total	$88,856 00

The receipts other than for the transmission of messages, and mainly composed of forced contributions from the communes, were as follows:

In 1867	$8,702 82
In 1868	13,388 03
In 1869	13,137 82
Total	$36,228 67

Thus it will be seen that during the past three years $125,084 67 have been received by the Telegraph Administration in Switzerland, and expended by it in the prosecution of the telegraph business, which was exclusively derived from other sources than from the transmission of messages.

The following table will show the number of messages transmitted, of all kinds, during the years 1868 and 1869:

	1868.	1869
Internal messages transmitted	798,186	951,337
International messages transmitted	282,627	308,905
Transit messages transmitted	72,279	109,182
Total	1,153,092	1,369,424

The increase in the number of internal messages transmitted in 1869 over the previous year was 153,151, or 19 per cent; in international, 26,278, or 9 per cent; and in transit, of 36,903, or 51 per cent. The total increase was 216,332, or 18 7-10 per cent.

◆

ANSWERS TO CORRESPONDENTS.

Shall free messages, when received for parties who have left town, be forwarded to them free?

Yes.

◆

The Committee of Foreign Relations of the House of Representatives have reported against a subsidy to the Pacific Telegraph.

◆

We have been presented with a fine photograph of the first telegraphic register ever used in America. We know it to be genuine, for we used the instrument in 1845, and recall its familiar form. Attention is called to an advertisement respecting it.

Executive Order No. 104.

On and after June 15, 1870, messages will be received at and for all stations on our lines in the United States east of the Mississippi River, including St. Louis, St. Joseph, Lexington, Kansas City, La Grange, and Canton, Missouri; Atchison, Leavenworth, and Lawrence, Kansas; Omaha, Nebraska; Keokuk, Davenport, Ft. Madison, Burlington, Muscatine, Clinton, Dubuque, Des Moines, Iowa City, Council Bluffs, Iowa; and Evansville, Indiana, for transmission during the night (*after all full rate messages have been forwarded*), and delivery the next day, at one-half the usual tariff rates, provided, however, that the tolls on any message at half rates shall not be less than fifteen cents.

N. Green, Vice-President.

◆

A Bad Mistake, and an Apology.

The following worthy people, two ladies and nine gentlemen, must have opened their eyes very wide and been very much angry on finding their names published in the Journal as "dismissed." In arranging the column of "resignations" an unlucky mention of two dismissed drunkards slipped in, as drunken men will, where it did not belong, and so in a portion of our last edition our "resignations" were divided, eleven unfortunate "resigners" coming in under the head of "dismissals." We humbly beg your pardon, ladies and gentlemen. We trust you will be more resigned to the error than we are, although we took and take the only means in our power to correct it.

The following persons, every way eligible, and highly esteemed by their superintendents, resigned their posts during April to enter upon other duties. We wish them all abundant success and happiness, and hope no one will ever treat them as unkindly as we have undesignedly done:

Thos. L. Earles	Nerepis, N. B.
J. C. Kelly	Newport, R. I.
M. C. Blanchard	Keene, N. H.
Miss H. Adams	Dedham, Mass.
J. H. Rankin	Westfield, Mass.
Ed. Whiton	Whitinsville, Mass.
Miss Amy Burton	Johnstown, N. Y.
D. Conger	Phœnix, N. Y.
C. H. Schermerhorn	Burlington, N. J.
J. E. Cardwell	Philadelphia, Pa.
W. H. Bixby	Hornellsville, Pa.

Mr. W. H. Bixby, one of those named above, is now train dispatcher of the Chicago, Burlington and Quincy Railroad Company, at Galesburg, Ill. The right man in the right place.

◆

An old, first-class operator desires to make an engagement during the Summer months to work as relief in a healthy locality, where the salary would justify. He is in good standing with the Company. Address Box 20, Goldsboro, N. C.

◆

Messrs. L. G. Tillotson & Co., with characteristic enterprise, chartered the other day the fine ferry-boat, "James Fisk, Jr.," and placed it at the disposal of the late car builders' convention for an excursion. It was a gay affair, at which we met some old and valued friends, once associated with us in telegraphic labor. A fine band discoursed sweet music, and our friend, Sheldon, we found deeply engaged instructing the delegates in the use of a certain "local battery" which we are sure was not Leclanche's. Mr. Tillotson also made a speech, and with his hand on his heart said with an emphasis pathetic and peculiar: "My friends, I am happy, because you are." He offers the boat and battery, Sheldon and all, to the first New York Convention of the Telegraphic craft. The battery is intense!

◆

At the Fair and Festival of the Washington Fire Company in Easton, Pa., May 21, a gold watch and chain valued at $130 was contested for between the telegraph operators, S. Schwartz of the Lehigh Valley Road at Easton, and J. E. Moon of the Belvidere Railroad at Phillipsburg, N. J. J. E. Moon received 789 votes, and Schwartz 563 votes—a majority of 226 for Moon.—*Exchange.*

TARIFF BUREAU.

Semi-Monthly Circular.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York.
June 15, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since June 1, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

230 Averills, Mich.
317 Blackstone, Ill.
240 Charlotte, Mich.
240 Eaton Rapids, Mich.
308 Fithian, Ill.
* Humbird, Wis.
260 Hastings, Mich.
151 Irondale, O.
* Lincoln, Neb.
114 Livingston, Va.
420 Logan, Mo.
* Neumansville, Fla.
143 Old Sweet Springs, W. Va., Summer Office.
* Sanderson, Fla.
240 Vermontville, Mich.

Summer offices at Montgomery, White Sulphur Springs, and Allegheny Springs, Va., in square 143, and Pequot House, Conn., have been reopened.

NEW OFFICES ON OTHER LINES.

	Tariff for other Lines.	*Leaves this Line.*
Duncanville, Ont. Metcalf, " Manotick, "	Same as Richmond, Ont.	Same as Richmond, Ont.
Alfred, Me.	25 2	Portland, Me.
Humbird, Wis.	115 8	Milwaukee, ck Chicago.
Lincoln, Neb.	90 6	Plattsmouth, Neb.
Neumansville, Fla.	50 4	Lake City, Fla.
Sanderson, Fla.	50 4	" " "

GENERAL INFORMATION.

Offices in Districts, I K, L, M, O, and Pacific Division, will hereafter collect 20 and 2 for "other lines" from Scranton, Pa., on business for Carbondale, Pa.

The following changes to rates to points named in California and Nevada have been made, and will go into effect June 20:

Brown's Sta., Gold Hill, Virginia City, Nev.; Grass Valley, Lincoln, Nevada, Smartsville, Timbuctoo, and Wheatland, Cal., 30 cents currency, or 25 gold more than San Francisco, Cal.

Gilroy and Marysville, Cal., 50 cents currency, or 40 gold more than San Francisco, Cal.

Haywards, Oakland, San Jose Junc., San Leandro, and Warm Springs, Cal., same rate as San Francisco.

Eastern offices will use the currency rate on prepaid messages, and the gold rate on messages sent collect. Business checked to San Francisco, as heretofore.

Offices in Districts F, I, and K will hereafter send and check business for the following points on Montreal Co.'s lines, in N. York, to Whitehall, N. Y. "Tariff for other Lines," as given herewith:

Altona 40 2
Bangor 40 2
Brasher Falls 40 2
Brushes Mills 40 2
Burke 40 2
Centreville 25 1
Champlain 25 1
Chateaugay 40 2
Clinton Mills 40 2
Ellenburg 40 2
Forest 40 2
Knapps 40 2
Lawrence 40 2
Lisbon 40 2
Madrid 40 2
Malone 40 2
Massena Spgs 40 2
Moira 40 2
Mooer's Junc. 25 1
Norfolk 40 2
N. Lawrence 40 2
Potsdam 40 2
do Junc. 40 2
Raymondville 40 2
Summit 40 2

For "140 Harrisburg, Pa.," in last Journal, read 140 Harmsburg, Pa.

TO OFFICES HAVING "SPECIAL SHEET A."

"Tariff for Other Lines" from Oil City to Tidioute, Pa., should not exceed 20 and 1. Offices having "Special Sheet A," using a higher rate, will reduce accordingly.

Tariff to Miamisburg and Middletown, O., will hereafter be same as to Dayton, O.

WILLIAM ORTON, President.

◆

The Western Union Telegraph Company have two operators on wire No. 19 between Scranton and Philadelphia, who can receive by sound and copy from 2,500 to 3,000 words per hour. They can send the same amount of words in the same time without flagging. In copying they use a common steel pen, the motion of which is like a streak of lightning. There are only two others in the United States who can approach the rate of speed evinced in this feat. One of these received and the other forwarded press matter for fourteen months, without a break.—*Allentown Daily Chronicle.*

Telegraphers' Mutual Life Insurance Association.

DEATH OF JOHN C. GREGG, MANAGER, ATLANTA, GA.

We learn through G. C. Merriwnther, Esq., of Mobile, Ala., that John C. Gregg, one of the earliest members of the Association, died in Buffalo, where he had gone on leave of absence for his health, on Sunday, the 12th instant. Mr. Gregg was at the time of his death Manager of the office of the Western Union Company at Atlanta, Georgia, and for some time lately has been in poor health. We hope to receive full particulars of his death before our next number.

This necessitates another assessment of one dollar upon the members of the Association, to which, after a longer interval without deaths than ever before, all will no doubt cheerfully and promptly respond. Here are some already received:

ASSESSMENT NO. 13.

W. C. Chapman,
J. D. Reid,
James M. Armstrong,
E. C. Cockey,
John C. Thomas,
Julian Soule,
W. H. Fessenden,
W. M. Pepper,
John Campbell,
Martin Berth,
John A. Conley,
C. J. Depew,
John C. Henry,
L. E. Curtis,
Stephen D. Jaynes,
H. H. Abrams,
E. H. Armstrong,
D. S. Bailey,
G. A. Dodd,
C. W. Hills,
F. W. Flint,
C. P. Mathews,
Bennett A. Pryor,
Miss J. M. Whitely,
C. A. Thomas,
James Rowe.

ASSESSMENT NO. 12.

B. S. Plumley,
A. J. Burton,
Leonidas Daniel,
F. P. Brown,
Jacob Madara, Jr.,
William Cannon,
R. N. Norton,
James Rowe.

◆

MORSE MEMORIAL FUND.

Received Since Last Issue.

W. G. Evans, Pleasanton, Ks.	$1 00
W. J. Edgar, Burlington, Iowa	1 00
J. McKechnie, B. & M. R.R., Iowa	1 00
J. P. Ludwig, Burlington, Iowa	1 00
J. Q. Beck, " "	1 00
A. R. Frame " "	1 00
C. L. Phillips, Montrose	1 00
W. S. Hagan, Carthage, Ill.	1 00
J. W. Baylis, Dallas City, Ill.	1 00
J. C. Fosdick, Shokokon, Ill.	1 00
J. B. Shew, Wever, Iowa	1 00
Miss Mary E. Hoffer, Mount Joy, Pa.	1 00
Henry Bentley, Philadelphia, Pa.	1 00
John Wintrup, Philadelphia, Pa.	1 00
Wm. Bockwell, Philadelphia, Pa.	1 00
David A. Curl, Philadelphia, Pa.	1 00
D. K. Jeter, Philadelphia, Pa.	1 00
Joseph H. Simpson, Philadelphia, Pa.	1 00
A. P. Eastlake, Philadelphia, Pa.	1 00
D. H. Bates, " "	1 00
James Merrihew " "	1 00
Isaiah D. Maize " "	1 00
George W. Snyder " "	1 00
Nicholas J. Snyder, Jr., Philadelphia, Pa.	1 00
William Carley " "	1 00
Ambrose A. Ziegler " "	1 00
John E. Zeublin " "	1 00
Heber C. Robinson, Philadelphia	1 00
Joseph S. Greena "	1 00
Albanus Brosius, Norristown, Pa.	1 00
E. L. Maize, Scranton, Pa.	1 00
Chas. H. Lawson, Scranton, Pa.	1 00
John Moffatt, Scranton, Pa.	1 00
F. H. Duncan, Scranton, Pa.	1 00

MUSIC FROM AFAR.

Ebner Stephens, Georgetown, Col.	2 00
A. M. Bush, Cimarron, New Mexico	2 00
Chas. F. Bennett, Denver, Colorado	2 00
B. F. Bush " "	2 00
George Dunham, manager, So. Adams, Mass.	1 00
H. S. D. Cameron, messenger, Carmansville, N. Y.	50
C. H. Brendel, operator, B. & O. R.R.	1 00

A DOLLAR FOR THE BABY!

Mr. Charles F. Chester of Washington, Iowa, having been made happy by the arrival of a daughter, June 2, sends a second dollar to the M. T. F. Sensible man.	1 00
Nellie Palmer	1 00
Robert O. Park, Wartrace, Tenn.	1 00
Frank L. Craft, Walton, Ky.	1 00

Here comes old Virginia, arm-in-arm with Tennessee:

SECOND DISTRICT, SOUTHERN DIVISION, W. U. T.

J. W. Kates, Superintendent, Lynchburg, Va.	$5 00
W. A. Ford, foreman, "	2 50
C. E. McClinen, manager, "	2 50
W. K. Oakey " Salem, Va.	1 00
J. Harvey Cutter, repairer "	1 00
M. Parr, " Cleveland, Tenn.	1 00
L. G. Oakey, manager, Jonesboro, Va.	1 00
J. C. Wade, " Christiansburg, Va.	1 00
C. A. Garland, " Central, Va.	1 00
J. F. Cecil, manager, Dublin, Va.	1 00
D. P. Sandoe, manager, Abingdon, Va.	1 00
M. B. Friqua, operator, Abingdon, Va.	1 00
R. E. Duke, manager, Greenville, Tenn.	1 00
R. W. A. Horner, manager, Rogersville Junction, Tenn.	1 00
J. R. Leach, manager, Morristown, Tenn.	1 00
J. F. Norris, manager, Culpepper C. H., Va.	1 00
C. H. Whittington, manager, Manassas, Va.	1 00
W. H. Thweatt, repairer, Manassas, Va.	1 00
J. W. Bondurant, repairer, Bristol, Tenn.	1 00
J. E. Irvin, manager, Blacks and Whites, Va.	1 00
W. J. Vernon, manager, Bonsacks, Va.	1 50
R. G. Ryan, manager, Glade Spring, Va.	1 00
B. B. Shortt, manager, Bristol, Tenn.	1 00
J. R. Brown, manager, Mossy Creek, Tenn.	1 00
J. C. Duncan, manager, Knoxville, Tenn.	1 00
H. W. Green, operator, Knoxville, Tenn.	1 00
T. A. Howard, operator, Athens, Tenn.	1 00
W. B. Shumate, manager, Warrenton Junction, Va.	1 00
G. G. Stillman, manager, Sweet Water, Tenn.	2 00
Geo. McKnight, manager, Charleston, Tenn.	1 00
C. P. Hill, manager, London, Tenn.	1 00
Samuel Reese, manager, Cleveland, Tenn.	1 00
C. R. Eves, manager, Chattanooga, Tenn.	1 00
J. W. Burton, operator, Chattanooga	1 00
P. Cooney, repairer, Chattanooga	1 00
J. W. Crews, manager, Wytheville, Va.	1 00
C. M. Williams, repairer, Wytheville, Va.	1 00

Here comes another deputation, boys and all, from Richmond and Southern Virginia:

J. R. Dowell, superintendent, Richmond, Va.	$5 00
R. M. J. Paynter, Richmond, Va.	5 00
Jos. McGovern, Richmond, Va.	5 00

W. C. Pamplin	$1 00	E. McCarthy	1 00
W. S. Taylor	1 00	E. T. Smith	1 00
E. W. Thompson	1 00	T. L. Crouch	1 00
Geo. R. Pace	50	M. H. Kimbrough	25
Geo T Harrison	50	S. P. West	25
Geo. B. Gaines	50	J. W. McEndoo	25
H. C. Lockwood	25	E. T. Krebbs	25
T. O. Rowene	25		

R. R. McCaine, Alexandria, Va.	50
John H. Finks, Charlotteville, Va.	1 00
Willie C. Walker, Charlotteville, Va.	1 00
J. N. Cook, City Point, Va.	1 00
M. E. Duke, Ashland, Va.	1 00
L. C. Angel, Chester, Va.	1 00
N. C. Harris, Fredericks Hall, Va.	2 00
R. G. Callam, Staunton, Va.	1 00
R. W. Connaban, Pamplins, Va.	1 00
W. Patterson, Farmville, Va.	1 00
J. H. Walsh, Danville, Va.	1 00
W. T. Harvey, Meherrin, Va., gold	1 15
D. C. Auchinbaugh, Hagerstown, Md.	2 00
E. H. Yelverton, Americus, Miss.	1 00
K. M. Early, Hightstown, N. J.	1 00

HERE COMES A WHOLE FAMILY, CHILDREN AND ALL.

ELMIRA, N. Y., June 13, 1870.

Mr. J. D. Reid, Chairman:

The telegraph operators and ex-operators of this city would like to contribute their mite to the Morse Testimonial Fund. Please acknowledge receipt through the JOURNAL and send me extra copies for operators outside of our Company. Some of them will join the Testimonial on receipt of a copy.

C. W. Gardiner, ex-division operator, E. R. R.	$1 00
H. B. Berry, division operator, E. R. R.	1 00
W. E. Lewis, operator, E. R. R.	1 00
F. E. Fitch, division operator, N. C. R. R.	1 00
W. N. Eastabrook, operator, N. C. R. R.	1 00
J. H. Shearer, operator, N. C. R. R.	1 00
H. C. Eckenberger, operator, N. C. R. R.	1 00
J. L. Bremer, operator	1 00
C. T. Fitch, operator	50
J. O. Risdon, ex-operator	1 00
W. B. Krees, ex-operator	1 00
R. L. Guion, ex-operator	1 00
W. E. Stagg, ex-operator	1 00
M. S. Palmer, manager, W. U. Tel.	1 00
F. W. Garnsey, operator, W. U. Tel.	1 00
Morris Brick, operator, W. U. Tel.	1 00
Will S. Allen, messenger	50
Chas. W. Minier, messenger	50
	$16 50

Yours respectfully, M. S. PALMER, Manager.

FORT VALLEY, Ga., April 23, 1870.

To JAMES D. REID, *Esq.*

DEAR SIR: We inclose you our mite, which we send as a tribute of affection and respect to our esteemed and venerable father Professor S. F. B. Morse, for surely he is our father, he being the inventor of the language which we his sons and daughters use in transmitting our thoughts, or the thoughts of others, over the magic wires, and upon which for a quarter of a century no living man has been able to make an improvement, and also from the fact that he is the original and oldest "Knight of the Key." We regret very much that our pecuniary circumstances will not permit us to contribute a larger and more substantial testimonial of our gratitude and affection. We respectfully suggest a "medal" as the most appropriate testimonial that can be presented to our aged "Knight and Chieftain."

To you we send our 73.

Very respectfully,
JOHN COYNE,
GEORGE MUTTART.

Improved Telegraphy.

An alleged improvement in telegraphy has been invented by Sir C. T. Bright of Westminster Chambers, London, which he describes as follows: "The invention consists in so arranging telegraphic circuits for the transmission of electrical signals through metallic conductors that when a wire is connected for the purpose of transmitting telegraphic signals, one of the poles of a galvanic battery or other apparatus for generating electricity is connected to one coil of a relay or of an indicating or signaling instrument of any kind, and the other end of such coil of the relay or indicating apparatus is connected to the metallic conductor, through which the currents are passed. The same pole of the galvanic battery or apparatus for generating electricity is also connected to another coil of the relay or indicating instrument, and the other end of such coil is connected to one end of a resistance coil or series of resistance coils or tubes of water, or other apparatus of low constructing power."—*Scientific American.*

◆

DELHI, Louisiana, May 23, 1870.

To the Editor of the Journal of the Telegraph.

If a pigmy station be entitled to a hearing, I respectfully offer my views on the subject of "Limitation of Membership," &c., of the Telegraphers' Mutual Life Insurance Association.

I am in favor of adding to the lists each and every employee of the Telegraphic Fraternity who is of good moral standing.

It was a noble sentiment uttered by a member some time since, to "receive the applicant if he have life enough to move a finger." Yes, Mr. Editor, take them, take all!

As to disbursements, I beg to offer that the families of the deceased members should get every dollar, for how few operators or other employees do you hear of who have aught but their salaries for support, and when the head of the family is taken away surely the remaining brethren could not begrudge the single little dollar to the wife and orphans of their late fellow laborer?

Could not more of our leaders be induced to aid and countenance that praiseworthy association by becoming members? The names of our worthy President and his able assistants, also those of the General and Division Superintendents, would greatly advance the interests of the Association.

Let us hope that the entire Telegraphic Fraternity will, in time, become banded together in this Association.

Truly yours, L. DANIEL.

◆

Cheerful People.

God bless the cheerful people—man, woman or child, old or young, illiterate or educated, handsome or homely. Over and above every other social trait stands cheerfulness. What the sun is to nature—what God is to the stricken heart which knows how to lean upon Him—are cheerful persons in the house and by the way-side. They go unobtrusively, unconsciously, about their silent mission, brightening up society around them with the happiness beaming from their faces. We love to sit near them; we love the nature of their eye, the tone of their voice. Little children find them out, oh! so quickly, amid the densest crowd, and, passing by the knitted brow and compressed lip, glide near, and laying a confiding little hand on their knee, lift their clear young eyes to those loving faces.

◆

MR. GEO. LITTLE has invented a rheotome to preserve the strength of the Leclanche battery. The idea is duplicate cells, one set relieving the other at intervals.

◆

Born.

NIGHTINGALE—To Henry C. Nightingale of Auditor's Department, Western Union Telegraph Company, New York, June 11, a son.

CHESTER.—To Charles F. Chester of Washington, Iowa, June 2, a daughter.

NEW

SUBMARINE CABLE.

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & ÆRIAL WIRES,

OF THE

HIGHEST INSULATION.

CHARLES T. & J. N. CHESTER,

No. 104 Centre Street,

EXCLUSIVE AGENTS,

offer for sale, as TELEGRAPH and ELECTRIC CONDUCTORS, Wires protected by the BEST INSULATOR and STRONGEST RESISTANT TO CHEMICAL ACTION and ATMOSPHERIC INFLUENCE.

After the experience of several years in the use of KERITE for purposes of insulation, we have concluded to adopt it as the very best substance for wire covering, not only for use of offices but for SUBTERRANEAN, SUBMARINE and ÆRIAL LINES. We have used it unprotected for years under ground, and exposed to the most injurious atmospheric influences—to heat, cold, and moisture—and have yet to learn its failure, when other ordinary insulating substances would have been rapidly destroyed. UNDER WATER it has retained an electrical charge for many hours, thus ranking it in the HIGHEST GRADE OF NON-CONDUCTORS.

We have, therefore, made arrangements not only to secure THE EXCLUSIVE AGENCY for its sale, for the purposes for which we have already sold it so largely, but to furnish complete

IRON-CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

In corroboration of our statements we append extracts from reports of those who have exposed it to the severest practical tests.

FROM PROF. SILLIMAN OF YALE COLLEGE

"Nov. 10, 1868.

"I am satisfied, as the result of my own researches, that Ozone is by far the most fatal of atmospheric influences. I have submitted portions of Kerite to the action of a highly ozonized air for a sufficient length of time to prove them, and at the same time have exposed the best English Gutta Percha Covered Cable to the same tests with the following result: After long exposure, Kerite resists perfectly! The best English Gutta Percha Cable was speedily destroyed. A few days' exposure to Ozone would produce more effect than many years in a normal atmosphere exposed to Carbonic Dysulphide, Nitric Acid, Sulphuric Acid, Sulphuric Dioxide, Nitric per Oxide Chlorine Gas, and Alkaline Hydrates. Gutta Percha is immediately dissolved in Carbonic Disulphide, and powerfully acted on by Alkaline Hydrates. Some samples of Kerite resist the action of the former in a surprising manner, and are completely unaffected by the latter."

"New York, May 14, 1870.

"In nearly two years since the foregoing was written I have made a considerable number of experiments upon the Kerite Compound of A. G. Day, all of which tend to confirm former results; while the practical test of the continued use of electrical conductors covered with it, and the growing favor with which they are received by electricians, offers the best guarantee of its permanent value. B. Silliman."

FROM MOSES G. FARMER OF BOSTON, MASS.

"I have tested 196 feet of this wire and found it a better insulator than Gutta Percha.

"The instrument used would have shown a current through 300,000 miles of telegraph wire. The 196 feet showed no leakage in water. The Kerite insulated wire withstands atmospheric agencies wonderfully, and will last for years when exposed to the atmosphere; likewise when buried in the earth there is no reason to apprehend decay. It is a well known fact that Gutta Percha deteriorates very rapidly when exposed to atmospheric influences, and therefore cannot be advantageously used for the covering wire for outdoor exposure, unless buried in permanent moisture."

FROM MR. E. A. CALLAHAN, SUPERINTENDENT GOLD AND STOCK TELEGRAPH CO.

"May 14, 1870.

"Under all circumstances it has given me the fullest satisfaction. The peculiar nature of our business renders it necessary for us to use the most perfectly insulated wire. I have tried several kinds of insulated wire, but have been compelled to take down and substitute Kerite instead. Wire strung a year since is as good as the first day put up; have tested it after three days' constant rain, and could not find one degree of escape. We use it in gas pipes, and sometimes placed near furnaces subject to very high temperature. I have not been able to detect the slightest change from its original condition.

"We have exposed it to the extreme cold and heat of the past two years and a half, strung over the roofs of buildings, which we consider the best test of its indestructible and insulating qualities."

THE

BISHOP GUTTA PERCHA WORKS,

422, 424, 426 East 25th St., N. Y.,

SAMUEL C. BISHOP,

PROPRIETOR,

ONLY AMERICAN MANUFACTURER

OF

PURE GUTTA PERCHA GOODS

IN THE

UNITED STATES.

Have on hand and made to order

SUBMARINE TELEGRAPH CABLES,

INSULATED WIRES, for

TELEGRAPH AND ELECTRIC USE, and for

BLASTING AND MINING PURPOSES,

in every variety desired.

As an Insulation for Telegraph Cables and Electric Conductors Gutta Percha has been universally adopted by all scientific and practical Electricians and Manufacturers of Telegraph Cables and Wires in this country and Europe, and has sustained, with increasing confidence in its superiority, the practical test of over twenty years' general use.

The PROPRIETOR *would say to all parties desiring*

SUBMARINE TELEGRAPH CABLES,

that he will guarantee to make and deliver at his Factory any style of Cable, Insulated with Gutta Percha, as low as they can IMPORT *Cable of the same style and quality.*

ORDERS RECEIVED AT THE FACTORY.

Messrs. L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK,

AND

BLISS, TILLOTSON & CO.,

247 So. Water St., Chicago, Ill.,

have been appointed by me GENERAL AGENTS for the sale of any Telegraph Cable or Wire manufactured at the Works in New York, at Factory Prices, delivered in New York.

JOHN THORNLEY, 503 Chestnut St., Philadelphia,

has been appointed Agent for the sale of any and all goods manufactured by me, at Factory Prices, delivered in New York.

SPECIAL AGENTS IN NEW YORK,

for sale of all goods (*except Telegraph Articles*), are

H. G. NORTON & CO., 26 Park Place,
RUBBER CLOTHING CO., 347 Broadway,
A. D. & C. A. HODGMAN, 201 Broadway.

SAMUEL C. BISHOP,

OFFICE AT FACTORY.

The First Telegraphic Instrument.

An interesting relic of the early days of telegraphy has been discovered at Morristown, N. J. It is the first instrument by which messages were received and sent by the aid of the electric current in the United States. When Prof Morse was experimenting on the power and capability of electricity as adapted to the transmission of words, he spent a large portion of his time at Morristown, where he was assisted by Alfred Vail, Esq., a practical machinist and inventor. At the Speedwell Iron Works of that town, then owned by the father of Mr. Vail, the experiments on the wires and on the construction of suitable instruments took place. On the completion of the experiments and the removal of Mr. Morse to Washington to bring his invention before Congress, Mr. Vail accompanied him, and, receiving the appointment of Assistant Superintendent of Telegraphs, was stationed at Baltimore, at that end of the experimental line. The instrument now at Morristown was one of two taken from Morristown by Morse and Vail—Morse using one at Washington and Vail the other at Baltimore. These instruments were in constant use for six years, when Mr. Vail, returning to Morristown, brought his with him, and where it has still remained in the possession of the family. Mr. Vail dying soon after, his instrument was specially left by a clause in his will to his eldest son as an heir-loom, while parts of instruments made during the experimental trials were left to Professor Morse, with a request that he would give them at some future day to the New Jersey Historical Society. An excellent photograph of the instrument was also taken, and with this a visit was made to Prof. Morse in New York. The Professor was delighted to see the representation of the first instrument, having destroyed, has he said, the fellow instrument which he had used in 1844. He readily recognized it, and wrote a certificate across the picture as to its being a true photograph of the first instrument ever used to transmit public messages. He also expressed a wish that the photographs might be generally distributed that it might be seen how little in essential points it differed with those now in use.

[*Tribune.*

INTERESTING TO ALL OPERATORS.

A HANDSOME

8x10 PHOTOGRAPH,

SUITABLE FOR FRAMING,

OF THE

FIRST TELEGRAPHIC INSTRUMENT

USED BY MORSE AND VAIL

ON THE EXPERIMENTAL LINE BETWEEN BALTIMORE AND WASHINGTON, IN 1844,

and on which the FIRST MESSAGE WAS SENT, together with a FACSIMILE OF PROFESSOR MORSE'S CERTIFICATE AS TO ITS GENUINENESS, and HANDSOME PHOTOGRAPHS OF FRANKLIN, MORSE, VAIL, and FIELD in an appropriate border.

☞ See full accounts in all the papers.

No operator should be without this most interesting reminiscence of the early days of Telegraphy.

Single copies, postage paid, 75 cents; 10 copies for $6; 20 for $10. Address

S. S. THOMPSON,
Telegraph Operator,
Morristown, N. J.

$1,000 REWARD

For any case of *Blind, Bleeding or Itching PILES* that Dr. BING'S PILE REMEDY fails to cure. It has cured cases of 20 years' standing. Try it, and get rid of the most troublesome disease flesh is heir to. SOLD BY ALL DRUGGISTS.

Laboratory—142 Franklin-st., Baltimore Md. June 15-1y

THE LECLANCHE MANGANESE BATTERY,

AN IMPORTATION OF THE

REAL LECLANCHE BATTERY,

DESCRIBED IN THE "JOURNAL OF THE TELEGRAPH,"

December 15, 1869,

RECEIVED AND FOR SALE BY

C. WILLIAMS, Jr.,
109 Court-st., Boston.

Journal of the Telegraph.

The sale of "Pope's Modern Practice" continues to be good, and we notice a desire on the part of telegraph executive officers and counsel to post themselves on telegraph matters through this and the less recent but equally interesting and more copious work of Mr. Prescott, which we regard as a sign of good.

FOR SALE.

—— SHARES

ATLANTIC AND PACIFIC TELEGRAPH STOCK,

AT ALMOST ANY PRICE THAT MAY BE OFFERED.

Address

P. O. Box 1,714, N. Y.

THE

LECLANCHE MANGANESE BATTERY.

A lot of the above BATTERIES just received.

They are furnished all complete, with the necessary chemicals to put into immediate action.

Address,

C. WILLIAMS, Jr.,
109 COURT ST.,
BOSTON.

CHARLES WILLIAMS, Jr.

100 Court Street,

BOSTON, MASS.,

MANUFACTURER OF

TELEGRAPH INSTRUMENTS,

BATTERIES,

AND MATERIALS OF ALL KINDS.

Wm. Kidd,
A. Boody.

C. B. Peirce,
C. S. Otis.

KIDD, PEIRCE & CO.,

BANKERS,

10 BROAD STREET AND 57 EXCHANGE PLACE,
NEW YORK.

Stocks, Bonds, Gold and Government Securities bought and sold on Commission.

CHAS. T. & J. N. CHESTER,

104 CENTRE STREET, N. Y.,

TELEGRAPH ENGINEERS.

And Manufacturers of

INSTRUMENTS, BATTERIES,

AND EVERY DESCRIPTION OF TELEGRAPH SUPPLIES.

Offer the best guaranty of excellence in their profession—in their long established business—in the extent and variety of their manufacturing facilities—in the many improvements introduced by them, now almost universally adopted or imitated—and in the extent of their business, domestic and foreign, enabling them to keep pace with telegraphic progress.

They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer.

McKEE'S RAILROAD SIGNAL BOX.

All Signals connected with the Railroad service should be uniform, conspicuous, and ready to display at a moment's notice. Under the present system when an operator receives an order to detain a train, he has to take his flag, hunt a suitable place to stick it up, and keep runnin; out every minute until the expected train arrives, to see that his flag or lantern don't get misplaced, or the view obstructed. More accidents occur from the proper signals not being shown than by any neglect on the part of operator or trainmen. The importance of having those Signals placed in a conspicuous position cannot be overestimated; it is the basis of all train dispatching by telegraph. This long needed improvement has been supplied in

"McKEE'S SIGNAL BOX,"

patented April 28, 1868, and February 8, 1870. This Box is in use on many roads, and all attest to its merits. Below we hand a few of the many letters we have received from railroad officials:

McKEE & CO,

Gentlemen: I am very happy to express the satisfaction that McKEE'S TELEGRAPH SIGNAL BOX has given since its adoption on this road, and especially when, on riding over other roads, I see how superior our system of displaying Telegraph Signals is to that practiced elsewhere.

Robert Harris,
Gen'l Sup't C. B. & Q. K. R.,

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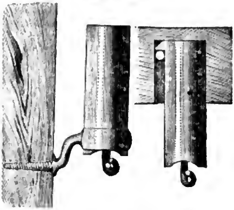

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JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 15. NEW YORK, JULY 1, 1870. WHOLE NO. 64.

INDIA.

The following congratulatory messages were transmitted June 23, on the occasion of a grand banquet in London to celebrate the completion of the submarine lines to Malta, by which communication with India has been freed from the embarrassments of ormer connections and rendered prompt and satisfactory:

EARL MAYO TO PRESIDENT GRANT.

President of the United States, Washington:

The Viceroy of India, for the first time, speaks direct by telegraph with the President of the United States. May the completion of this long line of uninterrupted communication be the emblem of lasting union between the Eastern and Western worlds. THE VICEROY OF INDIA.

Bombay, India, June 23, 1870.

PRESIDENT GRANT TO EARL MAYO.

The Viceroy of India:

Your dispatch of this date is received. I congratulate you upon the connection of your country with the balance of the world by telegraph, and join you in the wish for a lasting union between the Eastern and Western hemispheres.

Washington, D. C., June 23. U. S. GRANT.

THE PRINCE OF WALES TO PRESIDENT GRANT.

The President of the United States, Washington:

I feel sure you will rejoice with me on the completion this evening of submarine telegraphic communication between America, Great Britain, and India.

London, June 23. THE PRINCE OF WALES.

THE PRESIDENT TO THE PRINCE OF WALES.

His Royal Highness the Prince of Wales:

Your dispatch of this evening is received. America and Great Britain have reason to feel gratified at the successful connection of the Far East with them by submarine cable.

Washington, D. C., June 23. U. S. GRANT.

◆

THE PACIFIC AND ATLANTIC TELEGRAPH COMPANY.

We have been favored with a copy of the "Fourth Annual Report of the Pacific and Atlantic Telegraph Company of the United States," published May 3, 1870, together with the following extract from the minutes of a meeting of the Board of Directors of the above Company, held April 30, 1870:

"*Whereas*, Owing to various causes fully and clearly set forth in the President's Report, now submitted, adopted, and ordered to be printed for distribution among the stockholders, it appears that there have not been earnings from the lines of the Company for the past six months, sufficient to justify a dividend; therefore

"*Resolved*, That no dividend be declared at the present time."

The Pacific and Atlantic Telegraph Company began operations on the first of August, 1866, and on the first of December following declared a dividend of two and a-half per cent., continuing thereafter to pay a quarterly dividend, at this rate, up to October 1, 1869. On the first of January, 1870, however, when the usual quarterly dividend day arrived, it was announced that owing to the increased number of stockholders it was inconvenient to pay them so often, and therefore, in future, they would be made semi-annually; but when the day for the semi-annual dividend arrived, the announcement was made that no dividend had been earned.

To those stockholders who subscribed in good faith, and paid, for stock in this Company, in the belief that the dividends heretofore declared were derived from legitimate profits, this announcement must prove a surprise and disappointment; but if they should carefully examine the official reports of the Company we think they would have still more cause for surprise that any dividends should ever have been made heretofore.

The gross receipts of the Pacific and Atlantic Telegraph Company, from the beginning of operations in August, 1866, up to the 1st of October, 1869, as returned under oath to the Internal Revenue Department, is given in the following table, which also embraces a statement, taken from the official Report, of the amounts paid in dividends for the corresponding time:

	Gross Receipts, as returned under oath to the Internal Revenue Department.	*Amount of Dividends Paid.*
From August 1, 1866, to July 1, 1867......	$16,366	$8,003 26
July 1, 1867, to October 1, 1867.....	10,745	4,742 41
October 1, 1867, to January 1, 1868.	10,881	6,245 33
January 1, 1868, to April 1, 1868....	16,370	9,062 14
April 1, 1868, to July 1, 1868........	20,000	11,943 40
July 1, 1868, to October 1, 1868.....	20,000	16,306 99
October 1, 1868, to January 1, 1869.	23,000	18,980 54
January 1, 1869, to April 1, 1869....	27,000	19,906 36
April 1, 1869, to July 1, 1869........	41,000	21,172 40
July 1, 1869, to October 1, 1869.....	39,000	23,832 13
	$224,112	$139,794 96

Thus it appears that from the origin of the Company to the first of October last, over sixty-two per cent of tho gross receipts were divided among the stockholders, while for the quarter ending October 1, 1868, eighty-one per cent, and for the succeeding quarter eighty-three per cent. of the gross receipts were divided as net profits!

According to the returns made to the Internal Revenue Department, the gross receipts of the Company from the

1st of August, 1866, to April 1870, were...	$349.112 00
Expenses according to Official Report...	321,960 00
Leaving a balance of..................	$25,352 00

out of which the dividends of $139,794 96 must have been paid if they were derived from the net profits The official Report states, however, that the total revenues from August, 1866, to April, 1870, were $458,017 86, but as the returns to the Internal Revenue Department were $108,905 86 less than this sum, it is evident that a large proportion of the total revenue was derived from some other source than the earnings. What is the nature of this source of revenue which amounts approximately to the sums paid in dividends? Is it to be found in the sale of the Company's stock? Have all these dividends, which were supposed to be the fruit of a profitable business, been actually derived from the sale of the Company's paper? and was its inability to pay any more dividends owing solely to the fact that the Company could not find a market for any more of its stock at even twenty cents on the dollar?

These pertinent questions will very probably suggest themselves to a good many of the stockholders of this Company.

The Report makes the extraordinary announcement *that almost the only pecuniary motive which influenced the great proportion of those who purchased stock was to obtain cheaper rates for telegraphing, few, if any, expecting other dividends than those resulting from savings in telegraph expenses!* But is this statement true? If it is, why should the Company squander 62 per cent of the gross earnings in the payment of unexpected dividends? Why did they not expend all of their revenues in the extension of the lines and the reduction of rates? If it should prove to be a fact that they divided a very large sum of money which they never earned, continuing the dividends up to the time when it became impossible for them to sell any more stock at any price, the assertion that the stock was taken without the expectation of any dividends will scarcely be credited. Is it probable that all the canvassers for the stock of this Company said openly and squarely to every man whom they asked to take stock: "You will, of course, never receive any dividends upon it, but you will cause a reduction in the rates for telegraphing and thus become public benefactors?" We guess not. We rather think a more flattering inducement was held out. We never heard of any sort of fish that could be induced to jump voluntarily into a fisherman's net because by so doing they would cheapen the price of chowder or save the cost of salt! That the stockholders in this Company did not all subscribe from such disinterested motives we are led to infer from a paragraph in another part of the Report, which says: "Those who have invested money in the stock of this corporation, looking for the final completion of the line for returns, and anticipating the consumption of time as well as money to be necessary to the building up of a strong, permanent, and profitable telegraph company, will not be disappointed." We don't think there can be any question as to the *large consumption of time and money before this Company will be either strong or profitable*, but, as to the permanency of it, that must depend upon the ability and disposition of the stockholders to pay the current losses incurred in operating the lines, and make good the annual depreciation by decay.

Probably no experienced telegrapher would hesitate to say that the reported expenditures in working the lines are greatly under-stated; but if we admit, for the purpose of illustration, that the official statement of the Company's expenses is correct, we find that they have just about equaled their earnings, leaving nothing for interest on the investment, or for future reconstruction. No property is more perishable than telegraph lines, and the whole plant needs renewal about once in every ten years; therefore ten per cent on the cost should be laid aside every year to provide for the necessary reconstruction. About one-half of the life of the Pacific and Atlantic lines has already passed, and when the other half is gone where is the money to come from to rebuild them? The cost of their lines, as represented by their stock, is $1,575,850. If we admit that the lines of the Company cost but one quarter of this sum, and that the remaining $1,181,886 represent the profits accruing to the originators and promoters of the enterprise, there would remain an actual expenditure of $393,962, ten per cent upon which is $39,396, which must be put aside every year for the rebuilding of the lines when they have become useless from decay. Now, if the Company can scarcely earn its current expenses when the lines are new, where are the funds to come from to pay for their reconstruction?

There are certain discrepancies between the statements of earnings contained in the official Report, and in the returns made to the Internal Revenue Department, worthy of notice. In the official Report:

The earnings for March, 1869, are stated as	$17,455 93
The earnings as returned to Internal Revenue are	9,500 00
Difference	$7,955 93
The earnings for March, 1870, as stated in the official Report	$32,761 00
As returned to Internal Revenue	25,000 00
Difference	$7,761 00

The complaints in the official Reports against the Western Union Telegraph Company, for injuriously forcing immense reductions upon the Pacific and Atlantic Company, are both unjust and illogical. They are unjust because the Western Union Company has never reduced its rates upon a competitor, this Company simply attending to its own legitimate business, and never attacking an adversary unless in self-defense. It was the Pacific and Atlantic Company which began the warfare last Fall, and if they are not satisfied with the results they should at all events be honest enough to confess that they are alone responsible for them. They are illogical, however, since they claim that low rates were the chief objects sought for by them; and, as they have certainly been eminently successful in this respect, they have no just cause for complaint againt this Company for assisting them in its accomplishment.

The recommendation in the Report that legal action be taken against the Western Union Company to compel it to make rules especially favorable to the Pacific and Atlantic Company is certainly an original one; but we believe if it had recommended to the stockholders of the latter Company the prosecution of all parties who had induced them to part with their money, under false pretenses, for worthless and worse than worthless telegraph stock, and the stockholders should act upon the advice, much better results would be obtained.

GOVERNMENT TELEGRAPHS.

MR. ORTON'S ARGUMENT—Continued.

THE USE OF STAMPS.

Mr. Washburn—Why cannot the Western Union Telegraph Company adopt the system of stamps for their business?

Mr. Orton—I do not think any system of payment by stamps is possible in this country; it is very well in countries of small territorial extent, where it is not necessary to have more than one or two rates. In France, for instance, the franc stamp carries a message of twenty words, including the address and signature, from one part of France to another, while the half franc stamp carries it anywhere within the department. There is, however, a little trouble in respect to the excess over twenty words, but they accommodate that by charging for groups of words. But these excesses are rare as compared with the great mass of messages, which are ordinarily confined to twenty words.

Coming to the United States, however, at the rates proposed by Mr. Hubbard—which a year's experience, I apprehend, would satisfy him, would ruin anybody, even if the Government was at his back—a variety of stamps would be required; how many I will not say. But when you add the number of rates for the various distances over which messages are sent to those for the excess above the minimum, whether of ten or twenty words, you are involved in quite serious complications. It may be remedied by having stamps of small denominations, and using a sufficient number of them for the larger rates; but these stamps cost a good deal of money, and they are liable to be counterfeited. I have given the subject very serious consideration, in view of the saving which would ensue in simplifying and cheapening our system of checking, but I have not yet been able to see my way clearly for the adoption in this country of any stamp system.

MR. HUBBARD'S REASONS.

Mr. Hubbard—I have drawn up some reasons here why I think the system proposed by me is to be preferred to the present system.

The first is: because it will reduce the cost of telegraphing by utilizing the post-offices and postmasters, and adopting stamps.

Second: Because it will greatly reduce the cost of telegraphing, by consolidating the existing rival interests. I believe my friend (Mr. Orton) will say to the Committee that he has no doubt in his own mind that if all the existing telegraph companies were incorporated together as one, the entire cost of all the opposition companies could be saved to the community. That is, about seven or eight hundred thousand dollars a year could be saved by one company doing the business, and giving just as full accommodations to the public.

Mr. Washburn—You propose that your company should furnish the operators?

Mr. Hubbard—Yes, sir.

Mr. Washburn—Do you propose, too, that the postmasters shall act as operators?

Mr. Hubbard—A provision provides that the postmasters may act as operators, with the assent of the Postmaster-General.

Mr. Washburn—Exactly. Then where a postmaster acts as an operator, would he receive his pay from the Government or the company.

Mr. Hubbard—He would receive his pay by way of commission on the business done from the Government, the same as many country postmasters now do on the business that is done at their post-offices. My friend here (Mr. Orton) was at one time President of the strongest opposition company that was ever started in the United States—the "United States Telegraph Company." Even he, with probably the greatest executive ability of almost any officer in this country, could not save that company from making an annual loss of a hundred thousand dollars a year. And yet he will tell you that when that company was merged in the Western Union Telegraph Company the entire expense of doing the business was reduced by the Western Union Telegraph Company, besides saving the seven hundred thousand dollars which that company expended.

Mr. Orton—That is substantially true; opposition increases the expense to both parties.

Another reason is, because one State can now, by taxes or licenses, prevent any general system of low tariffs being carried into effect. For instance, they opened some lines in Montana, a short time ago, and the territory at once put very high licenses upon each office that they had opened. Any State, I suppose, has a right to impose whatever tax or license it may please to. As long as that is the case, no national system can be introduced. It is just exactly like the case of New Jersey imposing a tax upon every railroad passenger passing through the State. You can't fix and agree upon a regular tariff of rates when you have this uncertainty to deal with, and when at any time any one of the States can impose a heavy tax on you, and put an end to your plans.

Mr. Lawrence—The Supreme Court decided that New Jersey could not constitutionally impose that tax.

Mr. Orton—I admit the right of a State to impose such a tax on all business done within the State; but I deny that any State has the right to impose a tax upon commercial intercourse or communication between the citizens of one State and those of another. That certainly is a plain violation of the Constitution. But, as to the license tax, I don't see how we can get around that. We are taxed now as high as a thousand dollars for the right to do business in a single place. I think our license tax in the City of Mobile is $400 or $450.

Mr. Hubbard—One word more and I am done. In regard to the rates: My own belief is fortified by that of the best telegraphers in the country, that the enlarged business can be done at the rates named in the bill. The rates of the International Telegraph Company of Maine do not much exceed about 30 cents.

That Company pays its expenses, and pays a small annual dividend, and yet has to compete with the Western Union Company. The Franklin Telegraph Company's rates for messages are about 30 cents. It does not really pay its expenses. And, when I say that, I mean it just about pays its operating expenses, but has never accumulated a sufficient fund to keep its lines in repair.

Mr. Washburn—If it had a monopoly of the business—if it had all the business that is done by its competitors—at the same rates it is now operating, wouldn't it pay its expenses and make a profit in addition?

Mr. Hubbard—I have no doubt that it would; and it is simply from these two facts, that these two companies are in existence, that I have been led to believe that the business can be done at those rates; and the managers of those companies have expressed the opinion that the business of the whole country can be done at those rates. Of course, the average distance over which their messages are sent is small; I suppose 150 miles would probably be the average that messages are sent on either one of these companies' lines—less than that on the International Company's lines, and perhaps a little more than that on the Franklin. Of course the expense increases with the distance, but not in proportion to it.

Mr. Beck—You have stated that competing companies largely increase the expenses, and that one company might be able to do the work and make money, while two companies would, at the same time, lose money.

Mr. Hubbard—Yes, sir.

Mr. Beck—Now, take the Franklin and the Western Union Companies—they both have branch offices in this capitol. Isn't the effect of this to very largely diminish the cost of telegraphing to the public, by having the two companies in opposition.

Mr. Hubbard—I do not think it is. I think, if you will examine the history of corporations the world over, you will find that the immediate effect is just as you say—first reducing the prices to the public. Then the next thing is the failure of the weaker, and the absorption of the weaker by the stronger. You then have a double capital, upon which dividends must be paid. The corporation, in the long run, will always get a return upon the capital invested in it. For instance, as Mr. Orton has said, this Franklin Company is losing money from day to day, and cannot long continue without a failure.

Mr. Orton—You spoke of the International Company making a small dividend. Are you aware that if it should apply that small dividend, which you say has been paid, to a sinking fund, for the renewal of the poles when they decay, that the aggregate of the dividends would not be equal to the cost of renewing the poles. Have you ever given any attention to the great destruction that is going on all the while in this property?

Mr. Hubbard—I have given attention to it, as a general rule. I have not given particular attention as relates to the International Company.

Mr. Orton—It is a general question, covering the whole ground. The Franklin Company not only is unable to pay dividends, but has not paid the interest on its debt for two years, and its property is going to decay, without any ability to restore it. The International has had a little better fate, because there has been less competition. The Chairman inquired what competition the Franklin Company had. I will answer the question, if you will allow me. There are between Washington and New York the Bankers and Brokers' Company; and between Washington and Boston the Franklin Company; and between Washington and New York the Pacific and Atlantic Company—the Western Union Company being a competitor with all of them over the entire route.

Mr. Orton (to Mr. Hubbard)—I understood you to say, in your general remarks yesterday, that during your investigation of this subject your views had been modified in respect of the cost of doing the service.

Mr. Hubbard—Yes, sir.

Mr. Orton—Have you based your modifications upon information acquired as to the cost of rendering the service in this country merely, or have you taken into account the fact, firstly, that a large percentage (I assert 50 per cent.) of the cost of doing the business is paid for labor; and, secondly, that the cost of that labor in Europe is less than half what it is here. I wish to know to what extent you have considered this subject?

Mr. Hubbard—I have considered it; and I stated on the first day that I alluded to that fact, that here operators, according to the statement of the Western Union Company, could do nearly three times the amount of work that the ill paid and half starved laborers of Europe could do, and that here operators receive by sound, which enables them to reduce the expenses, and reduce the number of operators, and receive a greater number of words in the same time, which, to a considerable extent, therefore, compensated for the higher wages paid here than abroad.

Mr. Orton—You admit the fact of the higher wages here?

Mr. Hubbard—Of course.

Mr Beck—I understand you to say that the rate of charges for telegraphic messages all over Belgium is now ten cents.

Mr. Hubbard—The rate of what is called inland messages, that is, from one town to another within the territory of Belgium, is ten cents.

Mr. Beck—And that the average cost of sending a message in Belgium was 17.49 cents in gold?

Mr. Hubbard—Yes, sir; in gold.

Mr. Beck—Yet, at the same time, the telegraph in Belgium paid its own expenses.*

Mr. Hubbard—Yes, sir. I say so.

Mr. Beck—I do not quite comprehend how far the international messages, and the cost of them, were able to bring up that great difference between 10 cents and 17 cents and a fraction, and yet pay expenses in a small country like Belgium. Please explain it.

Mr. Hubbard—The reason is that on every international message passing through its territory, Belgium gets a franc. They estimate the cost of that message at about a quarter part of a franc; so that on that message they make three-quarters of a franc.

Mr Washburn—If you wanted to send a dispatch from Paris to Brussels what would be the expense of it now?

Mr. Hubbard—I do not know exactly. Belgium gets one franc upon it.

Mr. Orton—Here is the tariff. From Paris to Belgium there are five different routes. The rate depends upon the route by which the message is sent. The presumption is that it always goes by the most direct route, and at the lowest rate; but, in the event of an interruption of that line, it would go by another route. The lowest rate is 3 francs—60 cents.

Mr. Washburn—But you can send from Paris to the Belgian frontier for 1 franc.

Mr. Orton—You can send from one part of France to any other part of France for 1 franc; but from the French side of the frontier over the border, ten miles, it would be 3 francs.

From Calais to the Hague is 120 miles, and the tariff is from 4 to 7 francs, under the circumstances which I have explained. The lowest tariff is 80 cents gold; it may be $1 40. And so with the other rates comprised in this list.

I read, while in Paris, last January, the speech of the Chairman, delivered in December last, and I recall particularly his statement that from the most southerly part of France to the most northerly part of Great Britain a message may be sent for 55 cents. The Chairman had been misinformed. I have the new French tariff in my hand, and I find the rate charged is $1 20—more than double the amount stated by him. But that is not all. I have now taken the most northerly part of France and the most southerly part of England—only 23 miles apart—and I find the tariff is the same.

Mr. Washburn—Do you mean to say that a cable dispatch across the Straits of Dover is 120 cents?

Mr. Orton—Yes, sir.

Mr. Washburn—This is true, in point of fact, that from Nice, if you please, in the extreme south of France, you can send a dispatch for 20 cents to Calais; and from Dover, in England, to Inverness, in Scotland, you can send a dispatch for 24 cents; that would be 44 cents for a dispatch from Nice to Inverness, leaving out the crossing of the channel. Are not cables more expensive to operate than land lines?

Mr. Orton—On routes where the volume of business is large enough submarine cables are a great deal cheaper than land lines.

Mr. Washburn—Is this submarine cable operated by private parties?

Mr. Orton—I do not know, but I think not.

Mr. Washburn—I think there is where you will find the expense comes in.

Mr. Orton—But this discrepancy is not confined to cables. From Strasburg to Stuttgardt, 60 miles distant, the tariff is from 60 to 80 cents; and from Strasburg to Carlsruhe, a distance of 40 miles, the tariff is from 60 to 140 cents. There are no cables there. This extra charge is put on in consequence of crossing the line, even without repeating the dispatch. It is the protective policy applied to the telegraph. Some of the European Governments charge more for permission to shoot a message through the air, over the soil, than they charge their own people for rendering the entire service upon lines which they construct and maintain, so that the discrepancies in the charges for telegraph messages are not all confined to the United States. And this will explain why the losses of some of these countries are so much less than they would otherwise be. If we take the receipts of all these countries separately, there is not one of them that would not be found to have sustained a large loss; and, taking all the countries of Continental Europe, the loss on the telegraph business in 1868, the last year for which we have complete returns, was over $2,000,000 in gold.

In order that our statistics might not be challenged, as they have been by the honorable Chairman and others, we have taken much pains, since the 1st of January, by correspondence with the Directors of Telegraphs of every country in Europe, to procure the latest information on this subject, and we are prepared not merely to make the declaration, but to give the authority for every material statement we may make. According to our data the receipts of Belgium in 1868 were $239,420, and the expenses $258,385, exclusive of the amount paid for construction, which was $21,268. They have got into the habit, on the other side, of manipulating their statistics, and we have dug out of the Swiss report how it is done. Instead of charging up their construction expenses right along, they set aside a capital sum, and draw from it what is required, but charge into the construction account nothing but the interest on the capital which is expended in construction. Now, by that sort of *hocusing* returns, I could make a splendid exhibit.

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* The official reports show that the telegraphic receipts in Belgium, from 1865 to 1869, were $819,283, and the ordinary working expenses $916,576, showing a loss in five years of $97,293. The telegraph in Belgium has never paid expenses for a single year since the reduction in the rates for internal telegrams in 1866.

Mr. Palmer—Mr. Hubbard made the statement that in Europe, as a general rule, messages were received by the eye instead of by the ear, while in this country they are received by the ear or by sound. Did you find that so in your observations in Europe?

Mr. Orton—As a general rule, a modification of the Morse register--an instrument which makes the Morse characters on a strip of paper—is used not only in England, but throughout Europe. The needle system, working with two levers right and left, read by the eye, from the fluctuations of a needle, has been used to a considerable extent in England, but is now generally abandoned. The Morse register, the first Morse instrument introduced into the United States, has been substituted almost entirely for the others. We have received from Mr. Cully, the electrician of the Post-Office Telegraphs of Great Britain, within a fortnight, an order to make and send out to him some of our latest and most improved sounders—the instrument to read by sound.

Mr. Palmer—Mr. Hubbard made that point, as illustrating his statement, that the increased facility in this country for receiving messages was more than equivalent to the cheapness of labor abroad.

Mr. Orton—In that Mr. Hubbard is mistaken. The Morse register will run as fast as the instrument that is read by sound. It takes no more time to make a dot and dash on the paper than it does to make the "clicks" by the sound of which they are distinguished. If it is running, as in the case of the automatic machine which is used in England, in connection with the ink writing register, up to 80 words a minute, it is faster than an operator can copy; that rate of speed would require a copyist. But both operator and copyist together receive only an average of 28 shillings sterling a week, the total for both being about half the average pay of competent operators in our principal cities. We are able, however, to do better work with our facilities—that is, we can work a longer circuit with our apparatus on No. 9 wire, in this country, than they can work with their heavy, lumbering, complicated machines on the No. 6 wire. We should do still better if we had the No. 6 wire, and I have been introducing, within a few months, a larger size.

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ROYAL INSTITUTION OF GREAT BRITAIN.

SIMPLE AND USEFUL NOTES OF A COURSE OF LECTURES ON ELECTRICAL PHENOMENA, BY PROFESSOR TYNDALL, LL.D., F.R.S.

It is necessary to our further progress to have clear and definite ideas as to the character of the magnetic force.

1. The magnetic power of a magnet, or of a magnetic needle, though really distributed throughout its mass, appears to be concentrated at two points near the ends. These points are called the *poles* of the magnet or needle.

2. The magnetic power of the earth is, doubtless, also distributed through the mass of the earth, but a concentration similar to that just noticed endows the earth also with magnetic poles.

3. The action of the earth upon a magnetic needle is this; the north terrestrial pole repels one end of the needle and attracts the other; the south magnetic pole also attracts one end of the needle and repels the other. But the end attracted by the north terrestrial pole is repelled by the south, while the end attracted by the south is repelled by the north.

4. Thus to each terrestrial magnetic pole the needle presents two ends which are differently endowed. Two opposite kinds of magnetism may be supposed to be concentrated at the two ends. In this *doubleness* of the magnetic force consists what is called *magnetic polarity.*

5. Each of the two distinct kinds of magnetism may be regarded as self-repellant. North repels north, and south repels south. But different kinds of magnetism are mutually attractive; south attracts north and north attracts south.

6. When a magnet, or magnetic needle, is suspended with the line joining its poles *oblique* to the magnetic meridian, the earth's action on the needle resolves itself into what in mechanics is called "a couple," tending to turn the needle into the magnetic meridian.

7. When the needle is in the meridian, the two forces which constitute the couple are equal and opposite. The tendency to produce rotation then ceases; the needle is in its position of equilibrium.

8. When the forces are equal and opposite they must neutralize each other, no *motion of translation* of the needle being therefore possible. Thus, when the needle is caused to swim on water, or on mercury, it does not move toward either of the terrestrial magnetic poles.

9. One pole of a bar magnet repels the one end and attracts the other end of a magnetic needle. At the other end of the magnet the attraction and repulsion are reversed. In the middle of the magnet is the *magnetic equator*, where neither end of the needle is attracted or repelled.

10. An electro-magnetic helix, even without a core of iron, behaves exactly like a magnet. It attracts iron. Its two ends, moreover, are opposite poles, and between them is a magnet equator. When, however, a core is placed within the helix, the magnetism of the combined system is far more intense than that of the helix alone.

11. The strength of a magnet is measured by its power to deflect a magnetic needle from its meridian; the magnetic strength of a helix alone, and of a helix and core combined, are similarly determined.

12. To obtain the magnetic strength of the core alone, we first determine the strength of the helix alone, then that of the helix and core combined; subtracting the former strength from the latter, we obtain the magnetic strength of the core.

13. If the cores be thick and formed of good iron, the magnetic strength of the core is exactly proportional to that of the helix. A helix of double power will produce an electro-magnet of double strength; a helix of treble power an electro-magnet of treble strength, and so on. Thus by varying the strength of the helix we vary in like degree the strength of the iron core within it.

14. And here an important point arises. When we allow a core of double power to act upon a piece of good iron, nearly but not quite in contact with the core, the attraction of the iron is not doubled, but quadrupled. If the core be of treble power, the attraction is not only trebled, but it increases nine-fold. If the magnetic strength of the core be quadrupled, the attraction of the iron is augmented sixteen-fold. In fact, the attraction is proportional, not to the strength simply, but to the strength multiplied by itself, or to the *square of the strength* of the electro-magnet.

We must be very clear as to the cause of this action, and must, therefore, contrast for a moment the magnetic action of hard steel with that of soft iron.

15. Soft iron is easily magnetized, but it loses its magnetism when the magnetizing force is withdrawn. Steel is magnetized with difficulty, but it retains its magnetism even after the withdrawal of the magnetizing magnet.

16. This obstinacy on the part of steel in declining to accept the magnetic state, and this retentiveness on the part of steel when the magnetic condition has been once imposed upon it, are called *coercive force.* It is not a happy term, but it is the one employed.

17. Supposing a piece of magnetized steel to possess a coercive force so high as to resist further magnetization, its attraction by an electro-magnet would be directly proportional, not to the square of the strength but simply to the strength of the electro-magnet.

18. Why, then, does the iron follow the law of the square of the strength? It is because the magnetic condition of the iron is not constant, but rises with the strength of the magnet. When the magnetism of the core is doubled, the magnetism of the iron is also doubled. When the magnetism of the core is trebled, the magnetism of the iron is trebled. The resultant attraction is found by multiplying the magnetism of the iron by the magnetism of the core, and this product is the expression of the law of squares just referred to.

19. To make the matter clearer, let us figure the magnetism of the core as due to particles of magnetism, which are introduced into the core in gradually increasing numbers. Let us start with a core possessing one magnetic particle, and let it act upon a piece of hard steel also possessing one magnetic particle—the resulting attraction will be unity or 1. Let two particles be now thrown into the core—the steel, in virtue of its coercive force, remains unchanged, but its particle being now pulled by two particles instead of one, the resulting attraction will be 2. If three particles of magnetism be thrown into the core, all of them pulling at the single particle of the steel will produce a treble attraction, and so on.

20. Now let us start with a core possessing, as before, a single particle of magnetism, and with a piece of iron also possessing a single particle generated by the core—the attraction, as before, is here unity. On introducing two particles into the core, they generate immediately two particles in the iron. But the two particles, each pulled by twice the force first exerted, makes the attraction four times what it was at the outset.

It is to be remembered that every particle is attracted as if the other particles were absent.

21. In like manner, if three particles be thrown into the core, three particles are also generated in the iron. Each of these iron magnetic particles is pulled by the three particles of the electro-magnet; that is to say, each of the iron particles is pulled with three times the primitive force. But there are three particles so pulled; hence the attraction is nine times what it was at the outset.

22. Let us compare this action for a moment with that of gravity. Two masses of matter attract each other with a force which we shall take as our unit. If the one mass be doubled, the attraction is doubled; if both masses be doubled, the attraction is increased four-fold. If one mass be trebled, the attraction is trebled; if both masses be trebled, the attraction is increased nine-fold. When, therefore, both the masses are doubled and trebled, we have the law of squares. Now, it is this doubling and trebling, *in both cases*, of the thing which causes magnetic attraction which causes it to follow the same law.

23. Why do I lead you through these considerations? Simply to make clear to you that if "the law of squares" here developed shows itself in the action of a magnet upon matter, we may infallibly infer that the condition of that matter is not a *constant condition*, but that it rises and falls with the condition of the magnet. Matter thus affected is said to be magnetized by influence or by induction; it is attracted

or repelled (for we shall come immediately to the repulsion of matter by a magnet) in virtue of some condition into which it is temporarily thrown by the influencing magnet.

24 What, then, is the thing that causes magnetic attraction? The human mind has long striven to realize it. Thales (600 B. C.) thought that the magnet possessed a soul. Corneline Gemma, in 1535, supposed invisible lines to stretch from the magnet to the attracted body—a conception which reminds us of Faraday's lines of force. Cortes di Lodi thought the iron the natural nutriment of the magnet. Descartes embraced magnetic phenomena in his celebrated theory of vortices; and, in our day, Clerk Maxwell has worked in this direction. Æpinus assumed the existence of a magnetic fluid. Coulomb assumed the existence of two fluids, each self-repellent, but mutually attractive. Ampere deemed a magnet an assemblage of minute electric currents, which circulated around the atoms of the magnetized body. These conceptions are sometimes exceedingly useful as a means of connection and classification, even when we do not believe them true. William Thomson deduces magnetic phenomena from "imaginary magnetic matter;" thus giving the mind the conception while distinctly releasing it from belief. The real origin of magnetism is yet to be revealed.

25. Brugmans, in 1778, first observed the repulsion of bismuth by a magnet. In 1827, Le Baillif described the repulsion of antimony. Saigey, Seebeck, and Becquerel also observed certain actions of the kind.

26. In 1845, Faraday generalized these observations by demonstrating the magnetic condition of all matter. He showed that bodies divided themselves into two great classes, the one attracted, the other repelled by the poles of a magnet.

27. To the force producing this repulsion Faraday gave the name of diamagnetism.

What is the nature of this force? Is it inherent and constant? or is it induced?

28. The repulsion of diamagnetic bodies follows accurately the law of squares above developed. A double force produces a quadruple repulsion; a treble force produces a nine-fold repulsion, and so on.

29. Hence we may infer with certainty that the condition of diamagnetic bodies, in virtue of which they are repelled by a magnet, is a condition induced by the magnet, rising and falling as the strength of the magnet rises and falls.

30. The force of diamagnetism is vastly feebler than that of ordinary magnetism. Of all diamagnetic substances, for example, bismuth is the most strongly repelled; but its repulsion is almost incomparably less than the attraction of iron. According to Weber, the magnetism of a thin bar of iron exceeds the diamagnetism of an equal mass of bismuth about two and a half million times.

31. Diamagnetic bodies under magnetic excitement exhibit a polarity the reverse of that of magnetic bodies. In all cases whether we operate with helices or with magnets, or with helices and magnets combined, the actions of magnetic and diamagnetic bodies are antithetical.

32. An iron statue standing erect on the earth's surface is converted into a magnet by the earth's magnetism; a marble statue, or a man standing erect, is converted by the same force into a diamagnet; for marble is diamagnetic, and so are all the tissues and all the solids and fluids of the human body. The poles of the man are those of the iron statue reversed.

33. Organic bodies, and most crystals, are magnetised with different degrees of intensity in different directions. They are endowed with *axes* of magnetic induction.

34. Thus in the case of Iceland spar (carbonate of lime) the *repulsion* along the axis is a maximum. In the case of carbonate of iron, a crystal of the same shape and structure as carbonate of lime, the *attraction* along the axis is a maximum.

35. The position assumed by a crystal when suspended between the poles of a magnet, depends on its magnetic axes.

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IN CONGRESS.

Senator STEWART of Nevada on Monday, June 20, delivered himself of a speech on behalf of the Postal Telegraph, in which he roundly criticised the Associated Press and Western Union Telegraph Company. Having done this service to the nation, he took his seat, and his speech was printed in the *Globe*.

Senator DRAKE offered the following:

Resolved, That all foreign telegraph companies having offices, and receiving moneys in the United States, are subject to the Internal Revenue laws; and that all executive departments and officers of the Government are hereby directed and required to enforce said laws, as to said companies, both as to their future and past receipts of income, and charges accruing, collected in the United States. Referred to Committee on Finance.

JUNE 22.—Senator SUMNER reported favorably a bill from the Committee on Foreign Affairs, to facilitate telegraphic communication between the United States and Bermuda Islands. This bill asks no subsidy, and gives Government thirty minutes per day the free use of cable. Senator SUMNER, also, reported favorably the bill authorizing the Belgium Cable Co. to lay their cable between Belgium and the United States.

THE CUBAN CABLE CHARGES.

WASHINGTON, June 29.—General Baldy Smith today, through Mr. Casserly, presented an answer to the memorial of the Florida Telegraph Company.

INTERNATIONAL OCEAN TELEGRAPH.

Mr. HAMILTON—I ask unanimous consent to submit the following resolution for consideration at this time:

Resolved, That the special Committee on the Postal Telegraph be instructed to inquire if the International Ocean Telegraph Company has violated its charter by charging illegal or extortionate rates for the transmission of messages, and if any action on the part of Congress is necessary to protect the public; and for the purpose of this inquiry the said Committee be authorized to send for persons and papers and examine witnesses.

Mr. DAWES—What is the necessity for this resolution?

Mr. HAMILTON—The International Ocean Telegraph Company, having a line from Key West to Havana, has been charging exorbitant prices, it is alleged, for transmitting messages.

Mr. COBB of Wisconsin—I believe I will object to the resolution.

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THE French Cable Company have formerly renounced the exclusive grant from the French Government to land cables on the French coast. The French Government in notifying the United States Government of this action, has asked for authority on behalf of the French Company to land the cable long since landed at Duxbury. It will of course be granted.

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JESSE W. CROUSE, formerly superintendent of the telegraphs of the Penn. Central Railroad, has been appointed Assistant Superintendent of the North Western Telegraph Co., headquarters at St. Paul, Minn. This is a much merited appointment.

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THE name of J. C. Willetts of Chicago, we are requested to say, was placed on the list of strikers under a misapprehension.

ANSWERS TO CORRESPONDENTS.

Rule No. 9 directs that in sending the check of a message, "The amount paid or collectable will not be transmitted unless a part of the tariff is for other lines," &c. This rule is strictly observed.

In the case of a message originally from New York, via Detroit to Buffalo, the check comes to Buffalo "12 collect." Shall Buffalo collect the tariff from Detroit to Buffalo merely, or shall he collect the tariff from New York to Detroit also? The dispatch may have been prepaid from New York to Detroit, or it may have been sent *collect*. Please inform this office how we are to determine in such a case how much (if anything) has been already paid on the message, and how much we are and should be checked by the office which forwards the message? Two messages have just been handed to me by our delivery clerk from Boston, Mass., forwarded from Niagara Falls—checks are "12 collect" and "15 collect," but we have no means of knowing except by inquiry of that office, which delays delivery.

Any amounts due on a forwarded message at the office from which it is forwarded would be charged as paid other lines, and hence, in transmitting such message, the amount so paid should be stated in the check. For example: If a collect message was received at Detroit from New York for a party who had gone to Buffalo, and the dispatch was forwarded thence, the received message would be entered as paid in Detroit, and the forwarded message as collectable in Buffalo, the amount due on it at Detroit for its transmission from New York being entered as paid other lines. It is therefore clear, according to Rule 9, that in such case the amount payable in Buffalo should be transmitted, the amount for this line being first stated [that is to say, the tolls from Detroit to Buffalo], and then the amount for other lines [that is to say, the tolls from New York to Detroit].

If a forwarded message were received at Buffalo from Detroit, with simply the check 12 collect, the presumption would be that only the tariff between Detroit and Buffalo was to be collected. Any manager who should pay out money on a message either for its transmission by the lines of this Company, of any other Company, or for expressage, and should fail to state the amount when forwarding the message for collection to another place, would be wanting in ordinary business knowledge.

◆

Is "cannot" a single word?

Yes, although its combination as such is without any good reason. No one thinks of making "could not" one word, and yet there is the same reason for it as the other. To be accepted as one word it must be written as in the example given.

◆

A DELIGHTFULLY significant title is the Hawkeye Telegraph Company of Iowa. It connects with the Great Western, *alias*, as we are told, Josiah Snow. Good company that.

◆

THE British Postmaster-General promises to increase the telegraphic facilities for communication with Ireland. They are much needed.

◆

THE Dacia is not lost, and the man who said she was lives in London. A heavy reward brought out the pregnant fact. He ought to be drowned for his an-*Daciaty*.

◆

THE Dacia, with Sir Charles Bright and the cable to tie these United States to the West Indies, arrived at Porto Rico safely June 12. So St. Thomas, St. Domingo, and Jamaica will soon be "annexed" to the Great Republic.

◆

SENOR RIVERO submitted a project to the Spanish Cortes June 20 for a submarine cable between Spain and the Balearic Islands. The friends whom all of us have so long wished at the bottom of the sea will find a busy world down there if they go.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, JULY 1, 1870.

THE MORSE TESTIMONIAL.

The evidence that the movement for a testimonial to Professor Morse is to be a success, permits and invites us now to speak freely in regard to it. It seems now proper that some thought be given to what the testimonal shall be, and as to when and how it shall be given. Respecting all these we design now to say a few words, which we trust may commend themselves to all who read them. We cannot refrain from recording the fact, however, that the offerings of over one thousand persons have come to us without a question as to the use intended to be made of them, relying apparently on the assurance that in some suitable way honor will be done to Prof. Morse. We must regard this as a most grateful testimony to us, which we receive gratefully and hope to merit.

1. First of all, as many of our readers may not have seen the circular respecting it, we state that, prompted by what has been felt by many minds as a duty to one who by his genius, by his gentleness, by all that characterizes a genuine Christian gentleman, has honored alike his country and his kind, the telegraphers of America, to whom his one great invention has given employment and bread, have, at the suggestion of one of their own number, resolved to present to him, or to erect to his memory, some fitting and permanent testimonial. Until recently this has been only a thought, kindly entertained and desirous of expression in some way undefined, but which is now kindling into a very general enthusiasm, and must before long accomplish its desire in a way permanent and delightful. Mr. Morse is eminently worthy of all this. He is the representative of a new era in the world's life, an agent in the hands of the Divine Guide for the opening up of a vast avenue of intellectual activity and commerce, and for the provision of a wondrous means of bringing the parted hearts of the wide earth together. It is a fact most unique and remarkable that there is not a civilized nation to-day which does not use the identical instrument, unadded to and unimproved except in form, to which the brain of Prof. Morse first gave shape, and which human wants have seized and made universal. Even in design it is humbler than one of Mr. Morse's early conceits, which was to embody the register in a female form—a stylus in a maiden's finger making the record by the power of a hidden magnet. That, however, was an artist's fancy, perfectly easy of execution, but laid aside for the simple and inexpensive instrument, the click of whose merry lips may now be heard in every clime. A memorial to such a man, whose eyes are still smiling beneath the venerable hoar of nearly eighty years, is a great duty, and must, in its consummation, be a great delight.

Prof. Morse has received from the sovereigns of Europe:

1. By the Sultan of Turkey, the *Nishan Iftichan* or *Order of Glory*.
2. From France, the cross of the *Chevalier of the Legion of Honor*.
3. From Italy, the cross of a *Chevalier of the Order of St. Maurice and Lazarus*.
4. From Portugal, the cross of *Chevalier of the Order of the Tower and Sword*.
5. From Spain, the cross of a *Knight Commander (de numero) of the Order of Isabella the Catholic*.
6. From Denmark, the cross of a *Chevalier of the Order of the Dannebroge*, also to be a *Knight Commander* in the same order of the first class.
7. Austria, Prussia, and Wurtemburg, conferred on him the Scientific Gold Medal of their respective nations.
8. A Special Congress of ten European nations, in 1858, voted Prof. Morse an honorary gratuity of 400,000 francs.

But so far his native land has done nothing to signify the honor in which it holds him, except one solitary banquet which has no permanent record.

2. What shall the memorial be? On this point we give our own thoughts, which we place before our readers and friends, with no desire to dictate, but simply to guide. It would evidently fall far short of a great design to make a gift which would simply be held as a family memorial, however grateful to the family of Professor Morse that might be. In a generation it would be gone, and even the operators of 1890 would know nothing of it. We want another century to share in the knowledge at least of what we now do, and, if possible, to see its fruit. We therefore favor and propose the erection of

A MARBLE STATUE,

of the size of life, standing by the side of which shall be placed the first form of the Morse register on a fitting support, the whole to be erected on a single step of plain, pure white marble, and encircled by a simple, appropriate open railing, which shall preserve from desecration and yet not hide in the least from view. A sketch of this we hope soon to give if the idea prove acceptable, and by which additional funds may be received. That statue we would ask the Commissioners of our great Central Park to give an appropriate place, and, if necessary, provide a vestibule or erect a canopy for its reception.

3. This statue, on whose benevolent features future generations may gaze with a pleasure kindred to our own, and which would represent the homage of the entire living workers on the telegraph lines of the American continent, we would be glad to see inaugurated on the occasion of Professor Morse's eightieth birthday, on the 27th day of April, 1871, and to see it witnessed by representatives from every company, from every State, and, were it possible, by every operator. We shall not hesitate to ask the President of the United States to honor himself by witnessing or performing the part of its unveiling; and we would request the Chief Justice to pronounce fitting words to make the occasion sacred, dignified, and memorable. Such are our thoughts. We utter them modestly, yet confidently. We think the occasion demands all we propose.

4. In view of all this, and trusting that it meets acceptance, we ask every man and woman who has touched a telegraph key, or strung a wire, or planted a pole, or repaired a break, or cleaned a battery, or entered a message, or delivered one, who has managed a division, or directed or counseled in the management of a company, who has made a register, or covered a wire, or spun a cable, to join in this testimonial. Here is the spirit, for example, with which the matter proceeds. As we completed the preceding sentence a package was laid before us from which we take the following letter, and which seems characteristic of the feeling everywhere prevalent:

LOUISVILLE, Ky., June 17, 1870.

DEAR SIR: In behalf of the telegraphers of this office whose names appear on the accompanying list, I inclose to your care seventy-two 75-100 dollars, aggregate of amount tendered WITH A HEARTY GOOD WILL by *every person connected with our office*, to aid in procuring a testimonial for our friend, Prof. Morse.

A testimonial we all hope will be selected worthy of the man which will assure him that the good work he has accomplished here is appreciated by his host of friends, whose verdict is, what we pray it may be hereafter, "Well done, good and faithful servant." Yours truly,

T. R. BOYLE, Manager.

In the list referred to, which will be found elsewhere, the messenger's twenty-five cents stands as fair as the twenty-five dollars of the worthy General Superintendent, whose generous nature dictated the larger sum. We trust yet to receive from every office as unanimous a testimony.

We cite also the following: In Albany, N. Y., resides a gentleman of wealth and culture, who devotes much time to electrical matters, to whom we telegraphed requesting him to see Mr. Palmer, the sculptor, in relation to the expense of a marble statue of Mr. Morse. A day or two afterward we received his acknowledgment f[illegible] R. I., whither he had gone, as follows:

NEWPORT, R. I., June 1[illegible], 1870.

MR. J. D. REID.

DEAR SIR: I did not receive your telegram until this evening. I am sorry I am not at home and able to see Mr. Palmer. I have, however, written him inclosing your telegram. I feel quite complimented that you have thought of me, who am but an amateur in the telegraphic way, in this connection, but, having done so, you must also allow me to take my place in the rank of subscribers. I therefore inclose you my check for $25.

Yours very truly,

CLARENCE RATHBONE.

This is only an indication of the spirit with which the proposal to do a truly noble thing is received everywhere.

5. In our own relation to this work as Chairman we desire to say a word. The current year completes, sometime in September next, our quarter of a century of telegraphic service, and in the natural course of things that must soon close. During all of that period we have had charge of lines until within a few recent years, when younger men took our work and seated us at a desk. As a telegraph superintendent we endeavored to perform our duties with an authority based on kindness, believing that power to be the mightiest which held the heart. Never was superintendent more loyally served than we. In the warmth of

that same kindness we offer our hand to-day to every man and woman who has earned a dinner by the manipulation of a key, or bought a coat by the building of a line, to join us in this, perhaps, closing labor of our telegraphic life. We desire it as a great fraternal and filial act, alike to each other and to him of whom his country is justly proud, and whom many of us love. The day will come, we ardently believe, when you will all remember it gratefully.

But if any of you who are connected with other organizations cannot with pleasure to yourselves communicate with us because of our affiliations, then select, yourselves, some gentleman who will act for you as gladly as we would, and make him the medium of your gifts. We want no honor which will imperil the object, or prevent a single soul connecting himself therewith.

◆

TARIFF BUREAU.

Semi-Monthly Circular.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
July 1, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since June 15, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

* Arkadelphia, Ark.
448 Baxter Springs, Ks.
308 Browning, Ill.
* Bloomingdale, N. Y.
* Clayburg, N. Y.
50 Clarksboro', N. J., check Woodbury, N. J.
41 Cranford, N. J., reopened, check Elizabeth, N. J.
* Cherokee, Iowa.
467 Columbus, Ks.
455 Emerson, Iowa.
426 Earlham, Iowa.
130 Fagundus, Pa.
308 Frederick, Ill.
* Franklin Falls, N. Y.
390 Gardner, Tenn.
60 Georgetown, Del.
283 Glasgow Junc., Ky.
346 Hills Station, Ill.
Hugo, Col., tariff 25c more than Kit Carson, Col., for points east of Kit Carson; and 25c more than Denver, Col., for points N. S. and W. of Denver.
54 Kingston, Md.
* Lemars, Iowa.
* Mammoth Cave, Ky.
170 Minerva, O.
* Martins, N. Y.
* Milford, Pa., reopened.
131 Manor Station, Pa.
67 Mt. Pleasant, Del.
* Minnequa Springs, Pa.
21 Manchester, Mass.
94 Newport, Pa., heretofore an "other line" office.
* Paul Smiths, N. Y.
448 Pierce City, Mo.
* Redford, N. Y.
66 Sugar Notch, Pa., check Mauch Chunk, Pa.
* Shawneetown, Ill.
226 Stone Mountain, Ga.
269 Spring Lake, Mich.
* Saranac, N. Y.
130 Tideoute, Pa., heretofore an "other line" office.
45 Tribes Hill, N. Y.
437 Vibbard, Mo.
429 Verona, Mo.
58 Wyoming, Del.
* Wasatch, Utah, reopened.
130 White Oaks, Pa.

An office will be opened July 9th at "National Camp Meeting", Oakington, Md., and continued until July 25th, square 67.

NEW OFFICES ON OTHER LINES.

	Tariff for other Lines.	*Leaves this Line.*
Arkadelphia, Pa....	100 7	Little Rock, Ark.
Bloomingdale, N. Y.	15 1	Whitehall, N. Y.
Clayburg, N. Y......	Same as Port Henry, N. Y.	Same as Port Henry, N.Y.
Cherokee, Iowa....	100 7	Mo. Valley Junc., Iowa.
Chelsea, Que.......	Same as Richm'd, Ont.	Same as Richmond, Ont.
Franklin Falls, N.Y.	15 1	Whitehall, N. Y.
Gatineau Point, Que	Same as Richm'd, Ont.	Same as Richmond, Ont.
Greece Point, Que..	Do.	Do.
Isacoro, " ..	Same as Industry, Que.	Do.
Kenmore, Ont......	Same as Richm'd, Ont.	Same as Richmond, Ont.
Lemars, Iowa......	80 5	Mo. Valley Junc., Iowa.
Martins, N. Y......	15 1	Whitehall, N. Y.
Mammoth Cave, Ky.,	60 3	Glasgow Junc., Ky.
Milford, Pa.........	Same as formerly.	Same as formerly.
Minnequa Springs, Pa.	40 3	Williamsport, Pa.
Paul Smith's, N. Y.	15 1	Whitehall, N. Y.
Redford, N. Y.. ...	Same as Port Henry, N. Y.	Same as Port Henry.
Shawneetown, Ill..	100 7	Louisville, Ky.
Saranac, N. Y......	Same as Port Henry, N. Y.	Same as Port Henry, N.Y.
St. Nicholas Mills, Que.	Same as Aston, Que.	Same as Aston, Que.
St. Cuthbert's	Same as Industry, Que.	Same as Industry, Que.
Van Kleek Hill, Ont	Same as Richm'd, Ont.	Same as Richmond, Ont.
W. Winchester, Ont.	Do.	Do.
Winchester Springs, Ont..	Do.	Do.
Wasatch, Utah. ...	100 7	Ogden, Utah.

SUMMER OFFICES REOPENED.

112 Cresson Springs, Pa.
* Caledonia Springs, Ont.
* Cacouna, Que.
74 Chittenango Springs, N. Y.
30 Clarendon Springs, Vt.
46 Cornwall Landing, N. Y.
40 Catskill Mtn. House, N. Y.
30 Caldwell, L. George, N. Y.
27 Crawford House, N. H.
27 Glen House, N. H.
20 Jackson, N. H.
37 Lake Mahopac, N. Y.
* Mt. Vernon, N. H.
27 Mt. Washington, N. H., check Glen House, N. H.
27 Mt. Washington Depot, N. H., check Crawford House, N. H.
27 Profile House, N. H.
* Rocky Point, R. I.
45 Sharon Springs, N. Y.
57 Trenton Falls, N. Y.
27 Twin Mountain House, N. H., check Crawford House.
20 White Mountain House, N. H., check Crawford House, N. H.

OFFICES CLOSED.

Cameron, N. Y.; Echo City, Utah., and Shortsville, N. Y.

GENERAL INFORMATION.

The tariff to or from the "summer offices" in New Hampshire, except Jackson, named above, will hereafter be 20c more than the present rate by "square."

No rate to or from these offices, or between any two of them, shall be less than 50c.

Hereafter "rate for other lines" to Ashland, Neb., will be 35 and 2; and to Lincoln, Neb., 60 and 4 from Plattsmouth, Neb.

The "rate for this" and "other lines" to St. Anthony, Minn., should be the same as to Minneapolis, special or otherwise.

Hereafter "Tariff for other lines" from Oneida, N. Y., to Smyrna, N. Y., will be 30 and 2, and to Oneida Community, 15 and 2.

Business for Pamrapo, N. J., will hereafter be checked to Bergen Point, N. J.

Business for River Bend, Col., should be sent and checked to Lake Sta., Col., at rate of the latter.

Business for Lancaster, N. Y., will hereafter be checked as an other line office. Tariff and point where business "leaves this line," same as Town Line, N. Y.

Business for Gorham and Northumberland, N. H., will hereafter be sent and checked to Portland, Me., by all but such offices as are on "direct circuit with those points." Tariff 25 and 1 from Portland.

The name of Beverly, Mo., office has been rechanged to Round Grove, Mo.

The Post-Office address of Jonesboro', Ill., office is Anna, Ill. Messages addressed to Anna, Ill., should be sent and checked to Jonesboro', at Jonesboro's rate.

OFFICES HAVING "SPECIAL SHEET A."

Tideoute, Fagundus, and White Oaks, Pa., will hereafter be checked at same rate as Oil City, Pa., and Bowling Green, Ky., same as Nashville, Tenn.

On and after the 1st July the charge over Cuba lines, from Havana to following offices: Batabano, Bejucal, Bemba, Boca du Sagua, Bayamo, Consolacion del Sur, Colon, Cardenas, Cienfuegos, Caibarien, Ciego de Avila, Cuba, Guanajay, Guines, Guaimaro, Jiguani, Los Palacios, Los Punes, Matanzas, Pinar del Rio, Paso Real, Puerto Principe, Remedios, San Antonio, Santo Domingo, (Colonia), Sagua, Santi Spiritu, Trinidad, Union de Reyes, and Villaclara, will be reduced, for every ten words, to 40 cents, gold.

WILLIAM ORTON, President.

◆

Mr. D. H. Booth, the well known, able Superintendent of the Pittsburgh, Ft. Wayne and Chicago Railway lines of the Western Union Telegraph Company for over ten years past, has recently received a promotion, by the addition to his jurisdiction of the lines of the Pittsburgh and Erie Railroad, now making his railway telegraph management perhaps the most extensive in the country. It will be no matter of surprise to those who are familiar with Mr. Booth's ability as a Superintendent to hear of this extension of his authority. The lines between Pittsburgh and Chicago over the Pittsburgh, Ft. Wayne and Chicago Railway have always been regarded as among the most reliable and best managed lines of the Western Union Telegraph Company, which is due mainly to the energetic supervision of Mr. Booth, whose untiring personal scrutiny is always extended to even the smallest details pertaining to his position. "To him that hath shall be given."

◆

The French Cable Company have obtained the privilege of amalgamation with other companies on condition of relinquishing the exclusive right to land cables on the French coast.

THE MORSE TESTIMONIAL.

FROM THE CITIZENS OF FORT VALLEY, GA.

Fort Valley, Ga., June 24, 1870.

J. D. Reid, *Esq.*,

Inclosed find twenty-three dollars from the citizens of Fort Valley to the Morse Testimonial:

Anderson, & Co.........	$2 00	Averd & Brother........	$1 00
H. C. Harris............	2 00	Everett & Brown.........	1 00
Sturgess & Anderson....	1 00	E. M. Brown.............	1 00
W. C. Fountain..........	1 00	H. T. Brown.............	1 00
A. D. Skellie............	1 00	J. R. Mathews...........	1 00
O. H. Miller.............	1 00	W. J. Mathews...........	1 00
W. R. Brown.............	1 00	J. W. Mathews...........	1 00
W. W. Greene............	1 00	Wiggins & Co............	1 00
G. W. Byington..........	1 00	W. L. Shelton...........	1 00
J. F. Maddox............	1 00	L. W. King..............	1 00
Brown & Brother.......	1 00		

We commend the example of the citizens of Fort Valley to "the rest of mankind." It is another indication of the general interest which is being awakened in the matter.

HAIL! OLD KENTUCKY!

We, the undersigned, composing *every person* in the Louisville, Ky., office, hereby cheerfully subscribe the amount opposite our names to aid in the Morse Testimonial:

John Van Horne, general superintendent................	$25 00
Kearsley Carter, secretary................	5 00
T. R. Boyle, manager................	5 00
Nathan De Bree, chief operator................	5 00
A. K. V. Hull, night manager................	2 50
G. N. Norton, operator................	1 00
G. J. Golding, operator................	1 00
O. D. Phillips, operator................	1 00
D. J. Dingman, operator................	1 00
A. E. Grant, operator................	1 00
G. E. Netherland, operator................	1 00
C. A. Smith, operator................	1 00
E. F. Jenkins, operator................	1 00
W. L. Biggert, operator................	1 00
S. M. Dunlap, operator................	1 00
G. F. Starling, operator................	1 00
W. V. Duke, operator................	1 00
J. B. Watt, operator................	1 00
Wm. McCartey, bookkeeper................	2 00
Thos. McLellan, bookkeeper................	50
C. J. McGuire, receiver................	1 00
G. H. Todd, delivery clerk................	50
F. L. Harper, assistant clerk................	50
Thos. Fox, chk. clerk................	50
E. A. Buckner, chk. clerk................	50
Albert Learmouth, messenger................	25
J. H. Wade, messenger................	25
W. F. Atkinson, messenger................	50
J. Kirkleighter, messenger................	25
H. J. Chambers, messenger................	25
Thos. Mangen, messenger................	25
F. H. Miller, messenger................	25
M. L. Buckner, messenger................	25
James Quinn, battery man................	1 00
Sanford Johnson, colored porter................	25
J. W. Smith, com. news dep't................	25
Newton C. Holmes, messenger................	25
James Halden, messenger................	[illegible]
Horace Lingenfelter, messenger................	
Geiger Haas, messenger................	
W. H. Johnson, superintendent supplies................	
Robert Wilson, instrument manufacturer................	[illegible]

HERE COME THE OLD GUARD WITH THEIR SMOKY FACES!

Pittsburgh, June 28, 1870.

J. D. Reid, *Esq.*

Dear Sir: It is with great pleasure that I send you herewith our list of subscriptions to the Morse Testimonial Fund, from the Fourth district, Central Division, amounting to $240. I have sent this amount to Mr. Horner, Treasurer, New York, by telegraph transfer. The work is still going on, and I expect to have an addition to this list by your next issue. Also find inclosed herewith a list handed me by R. B. Hoover, Esq., of Allegheny City, amounting to $8 50, which is in addition to the subscription from that office which is included in our district list. I have also transferred the $8 50 to Mr. Horner, Treasurer. Very respectfully,

S. L. Gilson, Manager.

PITTSBURGH.

Chas. O. Rowe, Supt....	$10 00	J. S. Gray...............	$1 00
T. B. A. David, ex-Supt..	10 00	A. B. Hawes.............	1 00
Sam'l L. Gilson, manager	5 00	B. F. Lloyd..............	1 00
Sam'l L. Fullwood......	5 00	Geo. M. Eitemiller......	1 00
D. Fleming..............	5 00	W. H. Davy..............	1 00
M. H. Markle...........	5 00	Geo. W. Kane............	1 00
J. M. Fisher.............	5 00	J. B. Bryant.............	1 00
T. E. Moreland..........	5 00	Wm. M. Munson.........	1 00
M. E. Luce..............	5 00	C. R. Symmes...........	1 00
R. D. E. Rowe	3 00	A. B. Connelly..........	50
John Berryman, Jr.....	2 00	E. J. Corrigan...........	50
J. C. Arnold.............	2 00	MESSENGERS.	
Jno. B. Stewart, A. V. R..	2 00	Phillip Shaffer	50
H. W. Fulton	1 00	Geo. Wilson.............	50
W. C. Connelly..........	1 00	Chas. Hannan...........	50
Wm. C. Benney.........	1 00	Dennis Crowley.........	50
J. A. Duncan............	1 00	W. C. Connelly, Jr......	25
R. D. Holmes	1 00	J. A. Kennedy...........	25
Jno. A. Torrence........	1 00	Geo. A. Clowes, Jr......	25

T. D. Williams	1 00	Thos. Donohue	25
W. H. Maize	1 00	Joseph Baker	25
J. T. McConnell	1 00	W. B. Cowpland	25
James N. Kerr	1 00	W. Brauff	25
J. A. McKenna	1 00	J. D. Kavanagh	25
S. A. Duncan	1 00	Wm. Dougherty	25
L. McMullen	1 00	Dan'l Dougherty	25
H. M. Goewey	1 00	R. E. Murdoch	25
James Coulter	1 00	Wm. Byrne	25
J. A. Fisher	1 00	Edgar Hawkins	25
L. A. Madison	1 00	James Hammill	25
B. F. Arensburg	1 00	Wm. Welsh	25
J. Morgan, Jr.	1 00	John Miller	25
A. H. Askin	1 00		

ALLEGHENY CITY.

R. B. Hoover, manager	$3 00	Thos. C. Clark	50
M. Bratt, A. V. R.R.	2 00	Chas. B. Haley	50
M. H. Young	2 00	MESSENGERS.	
J. Q. A. Aughenbaugh	1 50	Asaph Hill	50
S. J. Armstrong	1 00	Benjamin Reno	50
Luther L. Smith	1 00	Walter Smart	25

W. P. Lucas, manager, Titusville, Pa.	2 00
P. P. Hauff, "	1 00
E. B. Frew, "	1 00
H. Langworthy, "	50
Herbert Bevier, messenger, "	50
Elam Davidson, " "	50
John Gibbs, " "	50
A. T. McKelvey, manager, Wheeling, W. Va	2 00
F. M. Ingram, "	1 00
Geo. Gilliland, "	1 00
J. A. Naylor, Burning Springs, Va	2 00
W. H. Kelty, Oil City	1 00
Ed. T. Ward, Oil City	1 00
N. M. Baker, Greensburg, Pa	1 00
C. B. Foster, Petroleum Centre	2 00
Ed. Foster, Petroleum Centre	2 00
F. M. Saunders, Shomburgh, Pa	1 00
J. V. Irons, Shomburgh, Pa	1 00
Wm. B. Mier, Somerset, Pa	1 00
Geo. W. Moltz, Rynd Farm, Pa	1 00
W. J. Higgins, Canton, O	1 00
J. A. Munson, East Liberty, Pa	1 00
Mrs. H. M. Ogle, Johnstown, Pa	1 00
J. H. Reed, Johnstown, Pa	1 00
Earl Ogle, messenger, Johnstown, Pa	50
Mrs. L. J. Slater, Mount Pleasant	1 00
Miss M. E. Fisher, McKeesport	1 00
D. P. Boyd, Columbia Farm, Va	1 00
J. K. Fleming, Brady's Bend, Pa	5 00
A. M. Coulter, New Castle, Pa	1 00
John McWilliams, messenger, New Castle, Pa	25
J. E. Palmer, Parker's Landing, Pa	1 00
Isaac S. Van Voorhies, Washington, Pa	50
J. E. Murdoch, Washington, Pa	50
John Rial, West Newton, Pa	1 00
Miss Aggie Orier, Clarion, Pa	1 00
Wm. Cramer, Clarion, Pa	1 00
A. Baurr, Brookville, Pa	1 00
E. M. Hendrick, Harmsburgh, Pa	1 00
F. O. Van Dusen, Wheatland, Pa	2 00
D. Carpenter, Pithole, Pa	2 00
J. J. Brady, Pleasantville, Pa	1 00
Lawrence Smith, Scrubgrass, Pa	1 00
E. Jeunatt, Franklin, Pa	1 00
H. T. and C. C. Morian, Enterprise, Pa	1 00
J. E. Reichert, Kittanning, Pa	1 00
H. B. Hilton, Kittanning, Pa	1 00
W. J. McElroy, Armstrong Run, Pa	1 00
M. J. Mason, Pioneer, Pa	1 00
Jas. S. Zimmerman, Stoystown, Pa	1 00
Robert P. Cann, Stoneboro', Pa	5 00
W. R. Allison, Indiana, Pa	1 00
Geo. S. Duncan, Plumer, Pa	1 00
D. E. Lockart, Personsville, Pa	5 00
D. E. Lyon, Sligo, Pa	1 00
D. B. Conrad, Sligo, Pa	1 00
John Suter, Penn. R. R., Pittsburgh	2 00
W. McCormick, Penn. R. R., Altoona	1 00
C. A. McCormick, "	1 00
J. W. McCoy, "	1 00
M. J. Stoner, "	1 00
G. E. Sickle, "	1 00
J. M. Oursler, Penn. R. R., Hollidaysburgh	1 00
H. W. Stoney, " Conemaugh	1 00
J. M. Scott, " "	1 00
E. H. Nichols, " Johnstown	1 00
D. J. Simpson, Penn. R. R., Derry	1 00
Miss E. McCrum, " Latrobe	1 00
L. E. McKelvey, " Greensburgh	1 00
Herman Reamer, " "	1 00
C. A. Converse, Western Penn. R. R., Blairsville, Pa	2 00
Miss M. E. Keesberry, " " "	50
J. K. Moody, Western Penn. R. R., Freeport, Pa	1 00
Miss M. C. Kelly, " " Saltsburgh, Pa	50
Miss Cora Davies, " " Apollo, Pa	50
Miss L. A. McCormick, W. Penn. R. R., Allegheny City, Pa	50
M. M. Wilson, Western Penn. R. R., Natrona	50
J. B. Sowers, P. & C. R. R., Connellsville	2 00
P. Wolfensberger, P. & C. R. R., Broadford, Pa	2 00
H. F. Brallier, " Layton, Pa	2 00
A. R. Bingham, " Shaner, Pa	2 00
Miss Ada Barclay, " Amontoun, Pa	1 00
W. T. Wiley, " Jacob's Creek, Pa	1 00
W. S. Muse, " Armstrong, Pa	1 00
Miss A. J. Foy, " Alpsville, Pa	1 00
Miss M. A. Strable, " Port Perry	1 00
J. Zimmerman, " Pittsburg, Pa	1 00
J. R. Funk, " Pittsburg, Pa	1 00

CLEVELAND AND PITTSBURGH R. R.

John Thomas, Wellsville, O	1 00
W. G. Brownson, Wellsville, O	1 00
P. Bruner, "	1 00
G. W. Brownson, "	1 00
W. H. Riley, "	1 00
D. W. Putt, "	1 00
M. B. Maloney, Atwater, O	1 00
Mary Frost, Bayard, O	1 00
R. H. Turner, Hanover, O	1 00
W. D. Armstrong, Ravenna, O	1 00
W. T. Wheelock, Bedford, O	1 00
B. T. Shreve, Newburg, O	1 00
E. C. McCue, Summitsville, O	1 00
J. McKeage, Smith's Ferry, Pa	1 00
A. K. Burroughs, Smith's Ferry, Pa	1 00
C. Wallover, Smith's Ferry, Pa	1 00
C. C. Kelly, Bridgeport, B. Co., O	1 00
M. R. Wolff, Steubenville, O	1 00
Geo. A. Brooks, East Liverpool	1 00
	$240 00

W. S. Rupp, Bridgeport, Pa., N. C. R. W	$1 00
J. E. Coleman, " "	1 00
Wm. J. Slepp, Goldsboro', Pa. "	1 00
B. F. Kinkwood, Parkton, Pa., "	1 00
Jas. B. Fisher, York, Pa., "	1 00
J. W. Zarker, Hanover Junction, Pa., N. C. R. W	1 00
S. Garman, Jr., Clark's Ferry, Pa., "	1 00
Thos. F. Lovejoy, Washington, G. Co., O	1 00
R. M. Hughes, Forest, O	50
	$8 50

ALL HAIL! ARKANSAS.

Little Rock, Ark., June 21, 1870.

James D. Reid, *Esq., Chairman, &c.*

Dear Sir: Inclosed herewith I send you sixty dollars, together with a list of subscribers to the Morse Testimonial Fund, with the amounts subscribed placed opposite each name. This contribution has been made willingly and cheerfully, and, I might add, is as liberal as could be expected from a district numbering only thirteen offices.

I am instructed to say that, in our humble opinion, a monument would be the most appropriate testimonial, and we sincerely hope the fund will be large enough to enable the Association to erect one. With our best wishes for the success of the good work, I remain

Yours, very truly, Ed. C. Newton.

Please acknowledge receipt.

J. B. Neely	$5 00	J. L. Newton	$1 00
Ed. S. Carl Lee	1 00	Geo. B. Hunt	5 00
Jno. W. Grogan	10 00	Wm. A. Pillow	5 00
A. L. Richardson	5 00	Ben. S. Pillow	5 00
J. P. Owen	1 00	Chas. E. Hunter	5 00
Wm. Abbott	2 00	L. Walter Brown	1 50
W. H. Chambers	1 00	Ed. C. Newton	5 00
J. W. Chandler	5 00		
John H. Dellmon	2 50		$60 00

MASSACHUSETTS.

Chas. F. Wood, Boston	$5 00
Chas. M. Lindsey, Huntington	1 00
G. E. Manley, operator, Washington	1 00
Katie Howe, operator, Palmer	1 00
A. E. Butterfield, operator, Ware	1 00
L. S. Shumway, operator, Dedham	1 00
A. H. Watkins, operator, Wellesley	1 00
M. Ranney, operator, Framingham	1 00
Osgood J. Fenton, Framingham	1 00
E. H. Cutler, operator, Ashland	1 00
T. B. Holden, operator, Newton Centre	1 00
J. B. C., operator, Shaker Village	1 00
W. J. Denver, Springfield	2 00
H. Denver, "	1 00
George R. Penn, "	1 00
H. B. Tannatt, "	1 00
E. J. O'Conner, Jr., "	1 00
Geo. M. Hoadley, "	1 00
Edgar T. Paige, operator, Chicopee Falls	2 00
F. B. Blake, Greenfield	1 00
E. S. Merritt, operator, Salem	1 00
A. F. Whitmarsh, operator, Neponset	1 00
S. E. Dunham, operator, Centre Abington	1 00
C. L. Hartwell, Charlestown	1 00
N. B. Chadsey, Warren	1 00
J. T. Brown, operator, Newburyport	1 00
C. C. Doten, operator, Plymouth	1 00
Jas. Mullins, messenger, Plymouth	50
Wm. Z. Whitmarsh, Dighton	1 00
Edward E. Belding, Chicopee	2 00
Andrew Smith, North Andover	1 00
A. C. True, Haverhill	1 00
Sparrow Horton, operator, Woburn	2 00
Lucy A. Butler, operator, Woburn	50
M. J. Taylor, operator, Becket	1 00
Office W. U. Telegraph Company, Lowell	2 00
A. C. Ritchie, Ashburnham	2 00
Ziba Nickerson, Chatham	1 00
K. C. Adams, operator, Franklin	1 00
M. Muldoon, operator, Brighton	1 00
H. Keyes, Waltham	5 00
P. L. Ryder, operator, Worcester	1 00
E. W. Bradford, "	2 00
F. L. Wheaton, operator, "	1 00
John P. Davis, clerk, "	1 00
F. L. Smith, operator, "	1 00
Frank Davis, operator, "	1 00
H. W. Verry, operator, "	1 00
W. H. Booth, operator, "	1 00
J. D. Raymond, "	1 00
John Rourke, messenger, "	25
John McHugh, " "	25
Michael Flynn, " "	25
Wm. Underwood " "	25
S. J. Parkis, operator, Walpole	1 00
B. R. Paine, New Bedford	1 00
J. T. Smith, operator, New Bedford	1 00
Geo. S. Hoyt, operator, "	1 00
Stephen W. Smith, clerk, "	50
Ella M. Stone, Uxbridge	1 00
Highland Light Office	25
Wm. P. Potter, Fall River	2 00
Geo. L. Ferrin, operator, Fall River	1 00
E. J. Swan, clerk, "	1 00
P. H. Borden, clerk, "	1 00
G. F. Milliken, manager, Boston	3 00
E. F. Leighton, operator, "	1 00
J. C. Barrett, " "	1 00
C. B. Noyes, " "	1 00
T. A. Davin, " "	1 00
Edgar L. Dodge, " "	1 00
Israel A. Sherman, " "	1 00
D. Harmon, " "	1 00
F. B. Holder, " "	1 00
E. E. Patterson, " "	1 00
W. E. Boyce, " "	1 00
J. C. Robinson, " "	1 00
C. W. Henderson, " "	1 00
J. A. McGee, " "	1 00
Nora C. Johnson, " "	1 00
P. J. McMahon, " "	1 00
F. Stevens, " "	1 00
J. W. Duxbury, " "	1 00
E. J. Fullum, " "	1 00
C. G. L. Pope, " "	1 00
W. H. Garland, " "	1 00
T. J. Calahan, " "	1 00
Thos. Kelly, " "	1 00
G. W. Leet, " "	1 00
W. W. Wood, " "	1 00
E. Davin, " "	1 00
E. B. Stover, " "	1 00
E. V. Russell, " "	1 00
T. W. Hoogs, " "	1 00
H. S. Martin, " "	1 00
Louise M. Sawin, " "	1 00
J. E. Wright, " "	1 00
Wm. McFarland, " "	1 00
D. B. Grandy, " "	1 00
C. H. Hatch, " "	1 00
J. H. Milliken, " "	1 00
J. S. Whitacre, " "	1 00
B. G. Winter, " "	1 00
T. R. Tenair, " "	1 00
P. P. Allen, " "	1 00
E. A. Beardslee, " "	1 00
Eugene Cadmus, " "	1 00
Elijah L. Bugbee, " "	1 00
C. J. Brown, " "	1 00
James Randall, " "	1 00
Wm. H. Fessenden " "	1 00
E. G. Fessenden, " "	50
R. Smith, " "	1 00
J. H. Switchell, clerk, "	1 00
Wm. B. Bride, clerk, "	50
Florence J. Crowley, clerk, "	50
Patrick J. Shea, clerk, "	25
Michael O'Hern, clerk, "	25
Chas. Sughrue, clerk, "	1 00
Frank J. Milliken, clerk, "	1 00
A. H. Nelson, officeboy, "	25
Wm. Martin, clerk, "	1 00
John O. McFarland, clerk, "	50
Jas. McGrath, clerk, "	1 00
Jno. McGrath, clerk, "	1 00
Ladies' Department, "	4 00
Geo. N. Thomas, clerk, "	1 00
B. C. Cate, lineman, "	1 00
Jeremiah Reagan, messenger "	25
Michael Shea, messenger, "	25
Jeremiah Keating, " "	10
John Cullen, Jr., " "	10
John D. Quinn, " "	10
Michael Curtis, " "	15
Daniel J. Mahoney, " "	10
Thomas O'Neil, " "	25
C. H. Powers, " "	10
Edward Lord, " "	25
Edward Farrell, " "	15
John Donovan, " "	15
John J. Riley, " "	25
Timothy McCarthy, " "	25
Daniel J. O'Mara, " "	15
John P. Noonan, " "	25
P. J. McCarthy, " "	15
Thos. J. Fitzgerald, " "	15
John McPartland, " "	25
David J. Mahoney, " "	10
John J. Moore, Jr., " "	10
Michael Noonan, " "	50
John F. Dawsley, " "	25
John J. Dowd, " "	25
Geo. W. Pealing, " "	25
Bunaby Bolger, " "	25
Wm. Troy, " "	25
James Sullivan, " "	25
Charles J. Tobin, " "	25
Etta Noyes, operator, Boston	1 00

$136 45.] Remitted by telegraph order, through John Horner, June 17, 1870. G. F. Milliken.

CONTRIBUTIONS RECEIVED BY W. T. WESTBROOK, WILMINGTON, DELAWARE.

W. T. Westbrook, manager, Wilmington, Del	$2 00
J. W. Hallam, operator, "	1 50
W. B. Griffith, " "	1 00
John White, repairer, "	1 00
Albert Watson, office boy "	1 00
Frank P. Moody, messenger, Wilmington, Delaware	1 00
H. T. Simpson, operator, Wilmington Depot	1 00
George Simpson, " "	1 00
Frank Carlisle, " "	50
George W. Cosden, operator, Elkton, Md	1 00
Harry Shiveler, " Newark, Del	1 00
J. W. Aydon, " Newark, N J	1 00
Alonzo Bowman, " Magnolia, Md	1 00
W. W. Simpson, " Newcastle, Del	1 00
W. F. Hilyard, " Middletown, Del	1 00
B. F. Fleming, " Smyrna, Del	1 00
J. F. Coalbourne " Dover, Del	1 00
A. B. Connor, " Felton, Del	1 00

George W. Johnson, repairer, Harrington, Del	1 00
W. E. Bingham, operator, Lewes, Del	1 00
Geo. T. Kay, " Seaford, Del	1 00
D. T. Rawlins, " "	1 00
John W. Calloway, " Delmar, Del	1 00
C. C. Waller, operator, Princess Anne, Md	1 00
	$25 00

THE CLEVELAND, O., SUBSCRIPTION.

J. H. Wade	$25 00	O. F. Stow	$1 00
E. P. Wright	5 00	O. A. Gurley	1 00
H. H. Melton	3 00	L. D. Morse	1 00
O. F. Stumm	3 00	V. D. Greene	1 00
C. W. Douglas	1 00	H. F. Douglas	1 00
C. H. Rudd	1 00	M. E. Cozzens	1 00
J. P. McKinstry	1 00	E. D. Giberson	1 00
Wm. A. Manning	1 00	E. T. Tindall	1 00
H. G. Buckingham	1 00	N. Kerver	1 00
J. C. Graham	1 00	N. A. Buell	1 00
C. A. Cadmus	1 00	C. H. Lapp	1 00
G. H. Wadsworth		L. A. Somers	1 00
D. C. Shull	1 00	George H. Burwell	1 00
A. J. Deason	1 00	C. F. Williams	1 00
J. W. Hays	1 00	J. M. Watts	1 00

CINCINNATI, O.

F. A. Armstrong	$3 00	Miss F. H. Curtis	$1 00
Geo. T. Williams	2 00	J. C. Hall	1 00
B. H. Johnson	1 00	A. H. Graham	1 00
W. T. Bodley	1 00	C. S. Lamb	1 00
T. H. Radford	1 00	M. C. Bristol	1 00
S. F. Maguire	1 00	C. W. Barnes	1 00
L. D. Hamilton	1 00	W. R. Morehouse	1 00
J. D. Dunning	1 00	A. R. Hargibt	1 00
C. S. Kinney	1 00	E. N. Baker	1 00
A. J. Gould	1 00	J. H. Griggs	1 00
C. L. Snyder	1 00	O. K. Newton	1 00
J. D. Thurston	1 00	C. F. Webb	1 00
C. G. Higdon	1 00	Geo. Makee	1 00
Geo. A. Clark	1 00	O. H. Everett	1 00
H. H. Scobill	1 00	J. S. Williams	1 00
J. T. Stephenson	1 00	Frank Fulton	1 00
C. A. Laubach	1 00	W. Brettam	1 00
W. J. Lawler	1 00	J. N. Maguire	1 00
Miss F. L. Webb	1 00	B. F. Coan	1 00

THE PITTSBURGH, FORT WAYNE AND CHICAGO R. R. TELEGRAPH BOYS.

O. H. Booth, superintendent, Mansfield, O	$3 00
W. D. Read, operator, Canton, O	1 00
A. Fulmer, messenger, Canton, O	25
W. Wilson, operator, Massillon, O	1 00
J. D. Butler, operator, Massillon, O	1 00
R. M. Wills, operator, Alliance, O	1 00
J. H. Cox, repairer, Alliance, O	50
W. S. Evans, operator, Orrville, O	1 00
Ed. O. Miller, operator, Shreve, O	50
M. H. Fulton, operator, Bucyrus, O	1 00
F. M. Boure, operator, Bucyrus, O	1 00
G. W. Maxfield, operator, Forest, O	1 00
C. C. Wetherlew, operator, Forest, O	1 00
F. P. Grippin, operator, Upper Sandusky, O	1 00
John F. Hey, operator, Upper Sandusky, O	1 00
Stanley E. Whitehead, operator, Crestline, O	1 00
A. W. Wilkins, operator, Crestline, O	1 00
C. W. Jaynes, operator, Crestline, O	1 00
G. A. Dodge, operator, Crestline, O	1 00
H. W. Wynkoop, operator, Crestline, O	1 00
D. P. Kirtland, operator, Crestline, O	1 00
B. F. Blair, operator, Crestline, O	1 00
C. W. Lloyd, messenger, Crestline, O	75
Mrs. A. E. Vignes, operator, Louisville, O	1 00
David Chidister, operator, Louisville, O	1 00
George P. Brown, operator, Lucas, O	1 00
E. V. Anders, operator, Mansfield, O	1 00
J. M. Klepper, operator, Wooster, O	1 00
T. J. McSweeney, operator, Wooster, O	1 00
W. H. Delaney, operator, Mansfield, O	1 00
J. V. Davy, operator, Mansfield, O	1 00
John Hoak, operator, Van West, O	1 00
H. C. Greene, operator, Delphos, O	1 00
J. W. Dudley, operator, Delphos, O	1 00
J. C. Campbell, operator, Loudonville, O	1 00
E. E. Desbrow, operator, Loudonville, O	1 00
N. Miller, operator, Alliance, O	1 00
A. J. Noe, operator, Orrville, O	1 00
J. A. Huntington, operator, Columbiana, O	1 00
E. J. Thompson, operator, Salem, O	1 00
R. J. Culley, operator, Salem, O	1 00
Geo. W. Griswold, manager, Hamilton, O	2 00
W. H. Cory, operator, Hamilton, O	1 00
Jasper McDowell, repairer, Hamilton, O	1 00
Alack Hagen, repairer, Hamilton, O	1 00
Samuel Cory, messenger, Hamilton, O	50

MOBILE, June 20, 1870.

J. D. REID, *Esq.*

DEAR SIR: Find inclosed forty-three dollars and seventy five cents ($43 75), amount subscribed by some of the boys in this district for the Morse Testimonial. I suppose a good many of them have remitted to you direct.

Yours, very truly,

C. G. MERIWETHER.

F. W. Bullock, operator, Letohatchie, Ala	$1 00
J. C. Terry, " Uniontown, Ala	1 00
J. E. Echols, " Loachapoka, Ala	1 00
James Murray, " Wetumpka, Ala	2 00
J. H. Pursley, manager, Rome, Ga	2 00
R. O. Camp, operator, "	1 00
L. K. Miller, messenger, "	25
C. C. Crowe, operator, Oxford, Ala	1 00
W. H. Adkins, operator, Acworth, Ga	1 00
Jerome Campbell, operator, Tensas, Ala	5 00
S. J. Hoffman, chief operator, Mobile, Ala	1 00
C. L. De Forrest, operator, "	1 00
D. L. Findley, " "	1 00
E. W. Mason, " "	1 00
E. B. Goulat, cashier, "	1 00
H. C. Beckwith, bookkeeper, "	1 00
J. J. Thompson, number clerk, "	50
V. A. Thompson, delivery clerk, "	1 00
Wm. Cass, messenger "	50
C. L. Moody, " "	25
John Wenzel, repairer, "	1 00
C. G. Meriwether, Superintendent Fourth District, Mobile, Ala	5 00
O. C. Harrell, manager, Columbus, Ga	4 00
A. A. Coleman, operator, "	4 00
C. W. Meyer, " "	1 00
G. W. Roland, messenger, "	50
J. N. Lister, operator, Demopolis, Ala	2 00
J. H. Purnell, " Opelika, Ala	1 00
E. Kennedy, repairer, "	50
H. K. Dunn, messenger, "	25
Frank G. Moffett, operator, M. & O. R. R. Depot, Mobile	1 00
	$43 75

Remitted June 20, 1870, by C. G. Meriwether, Supt.

MORE FROM VIRGINIA.

T. P. Robertson, Prospect Depot, Va	$2 00
P. Bashford, Fredericksburg, Va	3 00
F. D. Cardlipp, Fredericksburg, Va	1 00
J. W. Burruss, Greenbrier. W. Sulphur Springs, W. Va	1 00
R. H. Wright, Hanover Junction, Va	1 00

Please add these to my former list.

R. M. J. PAINTER.

ILLINOIS.

Here comes Illinois with its first delegation :

Geo. E. Spear, Bement, Ill	$1 00
K. H. Wade, Springfield, Ill	5 00
C. Dresser, " "	2 00
J. F. Reals, " "	1 00
J. A. Patterson, " "	1 00
R. H. Roberts, " "	50
W. N. Babcock, " "	1 00
T. Rice Smith, Berlin, "	1 00
E. Wolfsberg, Alexander, Ill	1 00
J. M. Allen, Jacksonville, "	2 00
C. M. Morrison, Chapin, "	1 00
J. M. Walker, Bluffs, "	1 00
H. W. Owen, Meredosia, "	1 00
E. B. Owen, Versailles, "	1 00
F. W. Pottger, Mt. Sterling, Ill	1 00
G. M. Bush, Mounds, "	1 00
O. L. Newton, Clayton, "	1 00
T. Burnett, Camp Point, "	1 00
J. D. Waldo, Quincy, "	1 00
J. L. Snyder, Denver, "	1 00
C. E. Moody, Carthage, "	1 00
A. W. Shiery, Howlett, "	1 00
C. E. Christiance, Mechanicsburg, Ill	1 00
F. G. Sampson, St. Augustine, Ill	5 00
Ira O. Morton, Calman, "	1 00
Chas. M. Gibb, Coatesburg, "	1 00
W. N. Lipe, Macomb, "	1 00
N. E. Bruce, Fowler, "	1 00
W. Everett, Gilson, "	3 00
L. R. Sykes, Elmwood, "	1 00
Alton Mann, Oak Hill, "	1 00
D. J. Smith, Colchester, "	2 00
C. Leslie, Oneida, "	1 00
D. W. White, Augusta, "	2 00
M. A. Elliott, Bushnell, "	5 00
A. T. Chittenden, Prairie City, "	1 00
C. Hennick, T. W. & W. Junction, Ill	1 00
W. Ehman, " " "	1 00
J. M. Graham, " " "	1 00
S. C. Whitcomb, Watega, "	1 00
Wm. McKee, Neponset, "	1 00
Chas. H. Lee, " "	1 00
J. P. Wentworth, Malden, "	1 00
J. M. Roodman, Sparta, "	2 00
J. M. Johnson, Mendota, "	1 00
F. H. Tubbs, sup't., Galesburg, "	5 00
W. H. Bixby, Galesburg, "	2 00
Janner White, Washington, "	1 00
A. B. Gunn, Peoria, "	1 00
Chas. D. Hyndman, El Paso, "	1 00
J. Kimball, Sciota, "	1 00
F. L. C. Dawes, Chenoa, "	1 00
H. L. Bennett, Chenoa, "	1 00
H. P. Gordon, Chenoa, "	1 00
D. A. Rogers, Fairbury, "	1 00
G. W. Ryan, Illiopolis, "	1 00
J. H. Gross, Mantle, "	1 00
J. G. O'Connor, Mantle, "	1 00
W. H. Crookshank, Decatur, "	1 00
F. H. Crookshank, " "	1 00
D. N. Syford, " "	1 00
H. W. Dustin, Cerofords, "	1 00
A. F. Parker, Bement, "	1 00
T. J. Gwin, Mowie, "	1 00
Ellis Stone, Tolono, "	1 00
W. H. Hallenbeck, Tolono, "	1 00
J. M. Ochiltree, Homer, "	1 00
J. K. Musselman, Fairmount, "	1 00
C. A. Fertig, Catlin, "	1 00
D. C. Swartz, Blandensville, "	50
T. F. Kent, " "	1 00
H. L. Baron, La Harpe, Ill	1 00
J. J. Soule, Burnside, "	1 00
W. A. Walker, Elvaston, "	1 00
M. A. Bacon, Warsaw, "	50
A. H. McGregor, Warsaw, "	1 00
J. W. Lipton, Warsaw, "	50
B. F. Ticknor, Peoria, "	1 00
S. F. Boyd, Peoria, "	1 00
Geo. L. Walker, Peoria, "	1 00
Day K. Smith, Peoria, "	3 25
J. M. Sutton, Canton, Mo	1 00
W. Everett, Henry, Ill	1 00
Geo. C. Parkins, Dixon, Ill	1 00
C. O. Judson, Nora, "	1 00
Ryall	1 00
W. A. Day, Urbana, Ill	2 00
M. A. Wheeler, Chatsworth, Ill	1 00
J. W. Putnam, Gilman, Ill	1 00
S. P. Belden, Watseka, Ill	1 00
Geo. D. Belden, Watseka, Ill	1 00
L. A. Neeley, Piper City, Ill	1 00
O. W. Bell, Glasford, Ill	1 00
L. Wheeler, Canton, Ill	1 00
L. Powers, Cuba, Ill	25
W. E. Chellis, Seville, Ill	50
M. Kewll, North Philadelphia, Ill	50
H. C. De Puc, Bushnell, Ill	1 00
D. Stafford, Minorka, Ill	1 00

NEW ORLEANS, LA.

D. Flannery, Superin't	$5 00	Chas. J. Alleyn	$1 00
OPERATORS.		Taylor L. Brown	1 00
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MARRIED.

BANGHAM—CORNWALL.—At Magnolia, N. C., by Rev. J. Worral Larmour, Rector of St. Stephens, Goldsboro, N. C., at the residence of the parents of the bride, Mr. T. W. Bangham, Manager W. U. Tel. Office, to Miss Fanny E. Cornwall.

We are glad to record this. Mr. Bangham is a member of the Tel. Insurance. Single men die fast. Marriage tends to longevity. So we are selfish in congratulating him, which, nevertheless, we do most heartily.

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FROM PROF. SILLIMAN OF YALE COLLEGE

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"I am satisfied, as the result of my own researches, that Ozone is by far the most fatal of atmospheric influences. I have submitted portions of KERITE to the action of a highly ozonized air for a sufficient length of time to prove them, and at the same time have exposed the best English Gutta Percha Covered Cable to the same tests with the following result: After long exposure, KERITE resists perfectly! The best English Gutta Percha Cable was speedily destroyed. A few days' exposure to Ozone would produce more effect than many years in a normal atmosphere exposed to Carbonic Dysulphide, Nitric Acid, Sulphuric Acid, Sulphuric Dioxide, Nitric per Oxide Chlorine Gas, and Alkaline Hydrates. Gutta Percha is immediately dissolved in Carbonic Disulphide, and powerfully acted on by Alkaline Hydrates. Some samples of KERITE resist the action of the former in a surprising manner, and are completely unaffected by the latter."

"NEW YORK, May 14, 1870.

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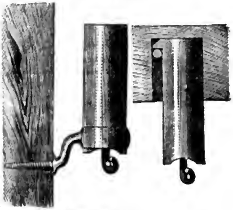

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JOURNAL OF THE TELEGRAPH.

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ARRANGEMENT AND MAINTENANCE OF BATTERIES.

BY GEORGE B. PRESCOTT.

As my article of August 15 on the arrangement and maintenance of batteries contained several typographical errors, I have concluded to reproduce those portions requiring correction, and to make such additions as a clear and accurate presentation of the subject seem to demand.

The quantity of electricity which exists in the form of a current upon a given length, size and quality of wire, is proportional to the number of cells in the battery; for, while the quantity of electricity produced by a battery is proportional to the amount of zinc decomposed in each cell, and is no greater in a battery of one hundred cells than in any one single element of that one hundred cells, the electro-motive force which is required to overcome the resistance of the conductors, or to force the quantity generated by a single cell through the wire, increases with every additional cell.

The quantity of electricity existing in the form of a current upon a telegraph wire from a given number of battery cells, is inversely proportional to the resistance of the wire, relays and battery.

To summarize:

The electro-motive force being constant, the quantity of electricity which flows through any circuit is inversely proportional to the resistance.

The resistance being constant, the quantity of electricity which flows through any circuit is directly proportional to the electro-motive force.

It is evident from the above considerations that the number of cells employed in a battery for working a telegraph wire should be strictly proportional to the resistance of the wire and relays. If a battery of a certain number of cells is employed to work several wires, the resistances of all the circuits should be approximately the same; for if a wire one hundred miles long is attached to a battery which supplies another wire of twice the length, the shorter wire will have twice the quantity of current that the longer wire receives. If, therefore, the electro-motive force of the battery is sufficient to work the longer wire, it is twice as great as the shorter wire requires, and the surplus strength is wasted. In estimating the length of a wire, of course the resistances of the relays must be included, and the size and condition of the wire, or its conductivity, properly considered.

Applying the foregoing principles, the strength of current upon each of the following wires when supplied from separate batteries of 50 cells each, will be found as stated in the eighth column. When all the wires are supplied from one battery of 50 cells the strength of current upon each will be as stated in the ninth column.

Number of Line.	Resistance of Line.	Resistance of Relays.	Resistance of Line and Relays.	Resistance of Line and Relays increased by 50 = Battery.	Conductivity of Wires.	Conductivity of wires, each increased by 50 ohms.	Strength of current when supplied by separate batteries of 50 cells each.	Strength of current when supplied from one battery of 50 cells.
1	3000	7600	10600	10650	00009433	.00009389	4,694	4,108
2	3000	6800	9800	9850	.00010204	.00010152	5,076	4,443
3	3000	5800	8800	8850	.00011363	.00011299	5,649	4,948
4	3000	4800	7800	7850	.00012820	.00012739	6,369	5,569
5	3000	3600	6600	6650	00015151	.00015037	7,518	6,397
6	1700	2800	4500	4550	.00022222	.00021978	10,989	9,677
7	3400	1400	4800	4850	.00020833	.00020618	10,309	9,072
8	2000	2600	4600	4650	00021739	00021505	10,752	9,466
9	2000	1000	3000	3050	.00033333	.00032786	16,393	14,515
10	2000	600	2600	2650	.00038461	.00037735	18,867	16,748
11	3000	400	3400	3450	.00029411	.00028985	14,492	12,807
12	1000	400	1400	1450	.00071428	.00068965	34,482	31,104

The problem of working the twelve wires from one battery is a case of branch circuits, and the question is, what is the joint or combined resistance of the twelve branches? This will readily be found to be R=337,384. If now we add to this the common resistance of the battery R=50, the total resistance of the circuit will be R+R=387,384, and the strength of current flowing through the battery, or generated by it, will be $S=\frac{50000}{387,384}=129.0709$. Now, this strength of current divides itself among the twelve branches in proportion to their several conductivities, as exhibited in the sixth column (conductivity is reciprocal of resistance, thus $\frac{1}{10600}$=.00009433).

If the resistance of the battery were less than 50 the strengths of current in the last column would approach more nearly to those in the eighth column; but on the contrary, were the resistance of the battery more than 50, the strengths of current upon the wires supplied from a common battery would depart more widely from those supplied by separate batteries of the same electro-motive force.

GOVERNMENT TELEGRAPHS.

A Washington advocate of Postal Telegraphs, writing over the signature of "Inland," whose arguments are so similar to those contained in Mr. Washburn's report as to lead one to suspect them of having a common origin, attempts to show that the forced contributions for the support of the telegraph in Switzerland are immaterial to the success of the system in that country, and that the business has always been financially successful under Government control. Now what are the facts? From the beginning of telegraphic operations under the Swiss administration in 1852, to the close of 1869, the expenditures of the service amounted to $1,938,738 65, and the receipts for the transmission of messages to $1,741,796 79, showing a deficit of $196,941 86. During this time, $223,525 49 was received from "divers other sources," mainly from compulsory contributions from communities desiring telegraphic facilities, and $88,856 from the National Treasury, making a total of $312,381 49. These figures are taken from the official reports of the Swiss Telegraph Administration, and are therefore correct.

There is a coolness in the manner in which these postal telegraph advocates beg the question at issue, and assume as acknowledged facts assertions which have been repeatedly shown to be false, that is decidedly amusing. Thus, for example, the writer above referred to, says: "Those who have read the Committee's report will have seen that it is a great mistake to suppose that the profit in European countries is principally derived from international and transit messages." Now, in the first place, the Committee made no report, and unanimously refused to assume any responsibility for that of Mr. Washburn; and in the second place, as nearly every country in Europe operated the telegraph at a loss in 1869—the aggregate loss amounting to more than $2,000,000—there was no occasion to discuss the question of profit at all. If the writer had said, "It is a mistake to suppose that the entire loss in working Government telegraphs in Europe is due to the low inland rates," his statement would have been intelligible, even if it was not strictly true.

Among other startling announcements which this writer makes is the following: "The transmission of international and transit messages involves very nearly the same amount of labor as internal messages, and the cost is very little more considering the number transmitted." That is to say, according to this astute reasoner, the expense to the Swiss Administration is less for transmitting, receiving, and delivering a message than for simply sending it alone, or than it is for allowing a message from France to pass over the Swiss wires into Italy or Germany, the Swiss Administration performing no service upon it whatever. On this basis we should think Mr. Washburn might make an economical exhibit for his postal telegraph, for it must be conceded that if he can transmit his messages withc expense, he can well afford to reduce the tolls or cent. But let us see how this result is arrived at. The postal telegraph amateur says: "In Switzerland, as shown by the report for 1869, the average cost of an inland message is not quite 11 cents, and the average cost of all messages, inland, international, and transit, 14 cents." This statement is not only untrue, of course, but the Swiss Telegraph Administration never made it. The Swiss report makes no statement whatever in regard to the cost of transmitting each kind of message, or of any kind, and this postal telegraph writer has simply confounded the rates of tolls charged upon each kind of message, with the cost of performing the service, a very grave error, especially where the charge is 22 cents for allowing a transit message to pass over the Swiss wires on its way from France to Germany, while it is only 10 cents for sending a dispatch from one Swiss town to another. The Swiss report for 1869 gives the number of messages transmitted during that year and the receipts therefor as follows:

951,337 internal messages at 10.4 cents......	$102,744 39
308,905 international messages at 22 cents...	67,959 10
109,182 transit messages at 22 cents........ ..	24,238 40
Total....	$194,941 81

Thus it will be seen that the tolls collected on 418,087 international and transit messages amounted to only $10,546 89 less than those on 951,337 internal messages. Is there any species of sophistry by which the advocates of postal telegraphy can make it appear that this extra charge of over 100 per cent on foreign messages has not been the means of saving the Swiss telegraph system from a very serious deficiency? Suppose there were in Switzerland no international and transit messages, as there are, comparatively speaking, none in the United States, what would be the financial result? The expenditures of the Telegraph Administration in Switzerland for 1869, according to the official report, were $214,240 83; receipts for internal messages, $102,744 39; excess of expenditure, $111,496 44. If the whole number of internal, international, and transit messages which were sent in 1869 had been paid for at the internal rate, the amount received would have been $79,451 31 less than the expenses.

Every country in Europe which has established a cheap rate for internal messages, imposes a rate more than twice as great upon all other classes of messages, and thus attempts to make up, by an extra tax upon their neighbors, for the loss incurred upon their domestic service. Whenever a postal telegraph advocate, however, mounts his special hobby, he always loses sight of the international and transit rates, and speaks only of the inland charges. In Mr. Washburn's speech in December last he stated that a message could be sent from the most northerly part of Great Britain to the most southerly part of France for 55 cents, but when Mr. Orton showed him from the official tariff that the rate charged was $1 20, he replied "that a message could be sent from Nice to Calais for 20 cents, and from Dover to Inverness for 24 cents—that would be 44 cents for a dispatch from Nice to Inverness, leaving out the crossing of the channel." But Mr. Washburn did not explain how he was going to get his dispatch across the channel. And this is the trouble with all amateur telegraphers who try to show how cheap telegraphing is done abroad; in all their calculations they neglect to show how they are to cross the channel.

Now, of course, there are few people who ever have occasion to send a dispatch from Nice to Calais, or from Dover to Inverness; and therefore it would make no difference in the telegraph receipts whether the tariff was 20 cents or 80 cents. But there are a great many people who wish to send sages from Paris to Brussels, Antwerp, Berne, &c., where the tariffs are 60 cents for less than a third of the distance.

Mr. Cyrus Field's letter to Mr. Washburn is quoted to prove that the telegraph is operated in connection with the post-office in every country in Europe; but, instead of proving what even Mr. Washburn knows to be untrue, it simply proves that Mr. Field may have the reputation of knowing a great deal about ocean cables, and have very little information about the administration of land lines. It is well known that England is the only country in Europe which has adopted the postal telegraph system. In France and Spain the telegraphs are under the control of the Minister of the Interior. In Russia, Prussia, Italy, Belgium, and Switzerland, they belong to the Ministry of Public Works. In Austria the administration of the telegraphs and the post-office were at one time united, but it was found expedient to separate them. In 1864 an effort was made in France to consolidate the post-office and telegraph service; but owing to the strong opposition evinced on the part of the chief functionaries of both services to such an amalgamation, it was relinquished.

The fact is indisputable that the telegraph is more extended in proportion to population, cheaper in proportion to distance, more generally employed by all classes of the inhabitants, and performs a better and more trustworthy service in the United States than in any country in Europe. If it were to be operated by the Government, even at the present tolls, it would not pay the expense of its administration, while if it were to be worked at the rates proposed by Mr. Washburn it would not only draw heavily upon the National Treasury, but would prove a much greater failure than the English system, as the territory embraced within the borders of the United States is greater than the British Islands. The only class of people who could be benefited by the adoption of the telegraphs in this country by the Government are the politicians, but have they not offices enough already without creating 5,000 or 6,000 more?

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NOTES ON ELECTRICAL PHENOMENA.

FROM A COURSE OF LECTURES BY PROFESSOR TYNDALL, LL.D., F.R.S.

Electro-Chemistry.—Chemical Actions in the Voltaic Cell: Origin of the Current.

161. Philosophers suppose matter to be made of elementary parts, called atoms, which are practically indivisable

162. The elementary atoms can be caused to unite to form compound atoms, which are called molecules.

163. Thus, water is formed of the combination of the atoms of oxygen and hydrogen; common salt is formed of union of atoms of chlorine and sodium; potash is formed by the union of the atoms of potassium and oxygen; the sulphuric acid, also, which we employed to acidulate our water is formed by the union of atoms of sulphur with atoms of oxygen.

164. When, as in our first experiment, two strips of zinc and platinum are dipped into acidulated water, the zinc, as we know, exerts a very strong attraction on the oxygen of the water. When the strips are united, this attraction triumphs; the oxygen unites with the zinc, and a voltaic current is established.

165. The oxide of zinc here formed combines with the sulphuric acid and forms sulphate of zinc.

166. By this removal of the oxide from its surface, the zinc is kept constantly clean, and thus enabled to attract other atoms of oxygen from the surrounding liquid. During this process the zinc gradually dissolves, and as long as this continues the electric current will flow. In fact, it is the constant dissolution of the zinc that maintains the permanent current.

167. The hydrogen of the water, as we have seen, escapes as a free gas from the surface of the platinum, which, unlike the zinc, is not dissolved.

168. We are not yet quite clear as to the precise way in which the electric current is supported by the solution of the zinc, but the following facts and speculations ought to be known to you.

169. When two different metals are brought into contact, with no liquid between them, one of them charges itself with positive and the other with negative electricity. We have here the famous "contact force" which Volta and his followers considered to be the urging power of the voltaic current.

170. But the generation of heat, and the performance of mechanical work, by the mere contact of two metals, would be equivalent to a perpetual motion. It would be at variance with the law which requires, for the production of any power, an equivalent consumption of some other power.

171. It is, however, a fact, that, when two different metals touch each other, the positive electricity resorts, by preference, to one metal, and the negative electricity to the other; the two electricities are, as it were, attracted differently by the two metals.

172. This difference of attraction, however, only causes a momentary re-arrangement of the two electricities, which pass, when the contact is made, into a new condition of equilibrium. As long as the contact continues, this equilibrium is not disturbed; there is no continuous current.

173. We may regard the distinct atoms which enter into the molecules of a compound as charged in a similar manner. For example, the atoms of hydrogen and oxygen, when they unite to form a molecule of water, may be looked upon as charged like the two touching metals. This would be the case if the atoms, like the metals, possessed different attractions for the two electricities.

174. When strips of zinc and platinum are plunged in such a liquid, the positively-charged atom will turn towards the one metal, and the negatively-charged atom towards the other.

175. But, unless the metals touch each other, electrical equilibrium immediately sets in, a constant state of electric tension being set up at the free ends of the two metals.

176. The electricity at the ends may be permitted to flow into a condenser, and may be thus stored up; such a condenser may then be discharged through a covered wire which passes round a magnetic needle, a deflection of the needle being thus produced.

177. Thus, in Davy's experiment with his large voltaic battery, wherewith he charged his battery of Leyden jars, the latter, after having been charged, might be discharged through a galvanometer, a magnetic deflection being thus produced.

178. But the metals, once relieved of their charge, would immediately re-load themselves with electricity, and might be again employed to charge a Leyden battery, and to produce a deflection of a magnetic needle.

179. At no moment during this process the battery circuit would be complete; still we would have a succession of magnetic actions similar to those observed with a closed circuit.

180. In fact, in the closed circuit the solution of the zinc incessantly removes the charged surface of that metal by dissolving it away, and enables the zinc to take a fresh charge; an incessant effort, never fully satisfied, is made to establish electric equilib-

rium; the incessant renewal of the effort maintains the electric current.

Chemical Actions at a Distance: Electrolysis.

181. Thus, then, in the cell where the voltaic current is generated chemical action occurs. We have, on the one hand, the decomposition of the water, and on the other the combination of the zinc with the oxygen and the sulphuric acid.

182. But a voltaic current can also produce chemical action at a distance from its place of generation. This discovery, as stated in Note 100, was made in the year 1800, by Nicholson and Carlisle.

183. We cannot decompose water by a single voltaic cell; but, when two or more cells are united to form a battery, the current from such a battery, when sent through acidulated water, tears asunder the united atoms of oxygen and hydrogen.

184. The oxygen is set free at the place where the current enters; the hydrogen is set free at the place where the current quits the liquid. If the direction of the current be reversed, the oxygen and hydrogen instantly change places.

185. It must be clearly borne in mind that the direction of the current, as already defined, is the direction in which the positive electricity moves. Knowing, therefore, the places at which the oxygen and hydrogen are liberated, we can infer with certainty the direction of the current through the liquid.

186. For every volume of oxygen liberated in the decomposition of water by a voltaic current, two volumes of hydrogen are set free.

187. Electro-chemical decomposition is called *electrolysis;* and the compound liquid decomposed by the electric current is called an *electrolyte.*

188. The electric current formed a powerful means of analysis in the famous experiments of Sir Humphry Davy, in 1807.

189. By operating with the current upon ordinary potash, Davy found the base of this substance to be a metal of exceeding lightness, and with an extraordinary appetite for oxygen. When placed on water, it floated on the liquid, and combined with its oxygen. By the heat thus generated, the liberated hydrogen was caused to burst into flame. When a globule of the metal was placed on ice, it burned with a bright flame, and the hole made by the heat was filled with a solution of potash.

190. Soda, treated in the same manner, also yielded a metal resembling that of potash. Thus Davy, by the use of the voltaic current, decomposed the alkaline earths, and greatly expanded our knowledge of chemistry.

191. To obtain these effects, it is necessary to bring the potash and the soda to a state of fusion by heat. In the solid state they are non-conductors of electricity. In fact, the molecules, when rigid, cannot turn in the manner indicated in Note 173. To conduct the current, it is necessary that they should thus turn and be decomposed.

192. When a current is sent through a solution of common salt, it decomposes both the water and the salt. The chlorine of the salt, in company with the oxygen of the water, appears where the current enters the liquid. The sodium of the salt, in company with the hydrogen of the water, appears where the current quits the liquid.

193. Chlorine possesses powerful bleaching properties; and, if the solution of salt be colored with indigo or litmus, the presence of the chlorine is declared by the destruction of the color.

194. When a current is sent through a solution of iodide of potassium, the brown substance, iodine, is set free where the current enters, while the metal, potassium, is set free where the current quits the solution. The experiment may be made by moistening bibulous paper with the dissolved iodide.

195. In electrolysis, it is usual to immerse two plates of platinum, or of some other suitable substance, in the liquid to be decomposed, and to send the current from plate to plate. The plate at which the current enters the liquid is called the positive electrode; the plate at which the current quits the liquid is called the negative electrode. Without the liquid, these electrodes would, as we have already learned, charge themselves with positive and negative electricity.

196. But, inasmuch as electricities which attract each other are of opposite qualities, the substance which is liberated at the positive electrode is called the electro-negative constituent, while the substance liberated at the negative electrode is called the electro-positive constituent of the liquid.

197. Thus, in the examples above given the oxygen, chlorine, and iodine are the electro-negative elements; the hydrogen, sodium, and potassium being the electro-positive elements

198. The terms electro-positive and electro-negative are, however, relative, for a substance may be electro-positive in one combination, and electro-negative in another.

199. If an electric current be conducted through a solution of sulphate of soda, it separates the sulphuric acid from the soda; the presence of the acid may be proved by its turning a vegetable color red.

200. When nitrate of silver or acetate of lead is decomposed by a voltaic current, crystals of silver, or of lead, are deposited on the negative electrode.

201. The chemical actions of the electric current, some examples of which are here given, constitute what is called electro-chemistry.

202. Electro-plating and gilding, and the electrotype process, are important applications of electro-chemistry. Here, a chemical compound, containing gold, silver, or copper, is decomposed by a voltaic current, the metal being deposited on the surface intended to be coated with it.

203. If the surface on which the metal is deposited have a design engraved upon it, the lines of the engraving are accurately filled by the metal, which, when the deposit is thick enough, may be detached, a perfect copy of the design being thus obtained.

Measures of the Electric-Current.

204. The *tangent-compass*, devised by Weber, consists of a vertical ring of brass or copper, in the centre of which swings a small compass-needle. The ring being placed in the magnetic meridian, the needle is deflected when a current is sent round the ring. The strength of the current can be proved to be proportional to the tangent of the angle of deflection; hence the name of the instrument.

205. The *voltameter* is an instrument devised by Faraday to measure the strength of an electric current. It consists of a graduated tube, which receives and measures the quantity of gas generated by the current in a given time.

206. The strengths of a series of currents measured by the voltameter are accurately proportional to the same strengths measured by the tangent compass. Placing a tangent-compass and a voltameter in the same series of circuits, the tangent of the angles observed in the one case are accurately proportional to the quantities of gas generated in the other.

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THE company which established a telegraph station on the steamer Brisk, anchored in the channel between England and the continent, has removed the ship and abandoned the enterprise, after a short experiment, to the regret of many to whom it was likely to have been most useful.

WAR TELEGRAPHS.

The French army (says an English journal) is provided with the means of telegraphic communication, and the following short account of the apparatus adopted may be interesting:

The batteries employed are cased in felt and fitted with bungs, and sawdust is employed to contain the necessary salts and acids. The apparatus used is that of Morse, and it is placed in a box with the galvanometer and a lightning conductor to protect the operator during storms. The conductors are covered with gutta-percha, so that they may be laid on damp grass or even in water. The telegraph carriage is formed in two compartments: that in front, being like the *coupé* of a railway carriage, serves for an office, while in the after part it carries the reel of wire. In the office there is a table which supports the instrument, two accumulators, one for the batteries and the other for the signal-bells, and a seat with places for two persons. The reel is supported by its axles in two parallel iron bars in the back compartment, so that the conductor is given out as the carriage proceeds on its way. This reel carries three kilometers of wire (nearly two miles), and extra reel carriages are provided which carry each twenty-one kilometers, or rather more than thirteen miles, and on seven reels. For mountainous countries the carriage is replaced by mules; one of the animals carries a small square tent, a tripod table, the battery, a stake and a bag of necessaries; the whole being arranged in drawers in two cantines, so that everything may be got at instantly without unloading; a second mule carries two reels of wire, one on each side of the *bat;* two other reels are carried on a barrow which serves for a reel frame, and which is drawn by another mule, and guided, and sometimes carried over difficult places by two men.

Each telegraph carriage is in charge of a sergeant, two corporals, and twelve men, who are divided into three groups. One group goes ahead with the sergeant, who traces the line; where poles are used this party makes the poles, and if the conductor is to be laid on the ground it cuts the trench; the second party has charge of the reels, makes the splices, and the third group lays the wire in the ground or fixes it on the poles. When the latter are used, they are generally placed about fifty or sixty metres apart. The officers in charge of the telegraph make a preliminary survey and lay down the general course for the sergeant and his men; they are answerable for the service, and are bound to inspect the apparatus and *matériel* daily

The time occupied in laying a cable or sunken wire on flat ground is about an hour for three miles, but when erected on posts it takes more than twice that length of time; and where the ground is rugged and sloping, of course progress is comparatively slow. When the telegraph has done its work it can be removed almost as quickly as the men can walk over the ground.

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IN former years we have often speculated on the idea of introducing repeating machinery in air and water-tight boxes, at certain distances, along the course of a submarine cable. We see it suggested in the columns of our sprightly cotemporary, the *London Electric Telegraph Review.* The light sea cables proposed by our friend Varley are also agitated. So far the proposal has received little or no encouragement. A curious and very doubtful plan of laying long cables in alternate strong and weak sections is spoken of, but we fail to see wherein the merit of such a design is to be found.

A PRACTICAL LETTER.

OIL CITY, September 1, 1870.

In your issue of August 15 is a long and interesting article by Geo. B. Prescott *about* the arrangement and maintenance of batteries.

A long stride at improvement is hinted or advised. I would say that a thousand *little* steps must first be taken.

To illustrate, I will give you an instance which is a common one throughout the United States: There is a wire running from a ground wire here to a battery of 40 cups only 39 miles away. On this wire are ten relays of an average resistance of 600 ohms each. When this battery is fresh and clean a very strong shock is felt through these 600 ohms resistance—about such a one as you would get at Cleveland from the Buffalo 60-cup battery in dry weather. After 9 p. m., these relays are all, or all but one or two, cut out, and on the following morning your 40-cup battery is simply nowhere.

I say this illustrates a universal fact. Now, it will not do to take down this battery, for the wire may be used at any time during the night, on account of trains on the road to which this wire belongs.

How much the resistance is decreased in the night—on an average—is a question for solution. I should guess, however, that the consumption of battery material is three times greater per hour during the night, after 8 o'clock, than in the day time, after 8 a. m.

The first step would be to bring every circuit to the same (approximate) tension; that is, a relay of 600 ohms resistance must indicate the same amount of magnetic power on one as on any other circuit of the company.

The second step would be to insure the permanence of this tension when established; that is, no relays must be cut out for any purpose whatever, nor any added to a circuit without compensation.

The principal excuse for cutting out is danger of lightning to instruments. This is no excuse, for a very little trouble and expense will make a "lightning arrester" which will protect the relay without fail. I know this to be a fact, for we never cut out here, though thirteen relays on both sides have been burned at one stroke, while ours were not phazed.

A safety attachment can be attached to any relay, which will not permit enough of the charge to pass on to the small wire to melt it.

But to bring these things about there must be men whose duty it is to bring them about, and afterwards see that they are maintained.

No amount of economical philosophy in the JOURNAL will cause the slightest move in the desired direction. Men do not care to economize for others unless they can themselves profit thereby. Arbitrary economy in the compensation for time and labor is, generally speaking, penny wise and pound foolish. If, therefore, a company would increase the duties and carefulness of its employés, it would seem essential to complete success that it, in some proper way, divide with them the profits of increased labor and economy. Yours truly, S.

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TELEGRAPHY IN CHILI.—Messrs. Clarke & Co. have presented a petition to the Congress of the Republic of Chili, in which they ask for a ten years' exclusive privilege (to run fifteen months subsequently to being conceded) for the erection of telegraph wires across the Cordillera. They also ask for a subsidy for ten years of $15,000 per annum, to commence on the day of the establishment of telegraphic communication between Valparaiso and Buenos Ayres; and finally, they solicit an exemption from customs' duties of all materials imported for the construction and preservation of the line. In consideration of these privileges, Messrs. Clarke promise to erect iron telegraph posts, and to forward free and preferentially all Government telegrams as well as those of Government authorities, and to turn over the whole line of telegraph at the expiration of the ten years at a fair valuation. The Buenos Ayres Government has, it appears, agreed to grant a subsidy of $30,000 per annum for ten years.

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To the Editor of the Journal of Telegraph.

There are three wires stretched along a main road, one of which has been run up to my house as a loop from an office, so that I could be switched on either of them, but the connecting office has been closed. What I want to know is, can it be fixed so as to run a wire up here from a place about twenty miles distant, so he can switch me on either of these wires when necessary? If so, how can it be done? You will oblige me very much by giving me your opinion in your next paper for my own benefit.

Respectfully yours, "SUBSCRIBER."

[You can be switched in by erecting two wires to any office however distant, or be permanently connected with one of the three wires by your present connections.—ED.]

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A LETTER FOR ALL TO READ.

SANTA FE, N. M., August 26, 1870.

To the Editor of the Journal of the Telegraph.

DEAR SIR: Thinking that a few ideas that an experience of eleven years have given me might not be uninteresting, and if followed out I am sure would greatly facilitate the working of a line under certain circumstances, I have taken the liberty of writing you.

I will try and express myself in very plain terms, so that all young operators will understand me, and in order to do so I will give the circumstances as they exist here to-day. As you are doubtless aware, this line extends from Denver, Col., to Santa Fé, N. Mex., about four hundred and twenty miles. To-day the line is down, on the ground between Cimarron and Trinidad, about half way between Denver and Santa Fé. The offices of Cimarron, Fort Union, Las Vegas, and Santa Fé are south of the ground connection, and Trinidad, Pueblo and Denver are north. Now then, as the ground connection is very strong, it is necessary for the offices on *either* side of the ground connection to adjust very high to get the writing of the offices on the *other* side. Here the remark we so frequently hear in working a line under similar circumstances applies exactly: "I have to turn up so high for you that I cannot hear my own writing." This remark is often made as an excuse for not being adjusted so as to feel a break from an operator to whom they are transmitting. To-day, in order to hear Denver, I have to adjust so high that I cannot hear a dot of my own writing, and yet by a very simple contrivance, which can be attached to any relay in half a minute, the writing of every office on the line, including my own, comes clear and firm, *on the same adjustment.* The contrivance I use is this: When the line is on the ground I put a very small, fine rubber band over the armature of my relay, and stretch it so that it will pull the armature quite smartly *toward* the magnets, and then fasten it, with the steady strain pulling the armature *toward* the magnets; I then adjust high enough to get the writing of the furthest office on the other side of the ground connection, and I am then adjusted for every office on the line; my own writing will close the local circuit promptly and sharply, whereas if I remove the little spring pulling the armature *toward the magnets*, I cannot hear my own writing or that of any office on *this* side of the ground connection.

I have never seen this used by any one, and can hardly think I am the first to think of it; but I am satisfied it is not generally known among operators, and if my young brother operators would try it, I think they would find it work to a charm and save themselves many scoldings for not adjusting, and would find they could work a line quite readily when they would otherwise think it was useless to try.

I would like to hear from them.

By the way, why would it not be a good plan for our instrument makers to fix this spring on the instruments? But don't use wire springs; a good deal of unnecessary breaking would be avoided, *under ordinary circumstances*, by not using *wire* springs for relays at all.

I have already taken up too much of your space, but there is another little expedient I have tried, and which I think might be quite a saving to the company in the item of local porous cups. You are aware that after a local porous cup has been used for a length of time, copper will deposit on the cup, increasing its size so that it cannot be conveniently placed in the local jars, and rendering the porous cup unserviceable. This can be wholly avoided by covering the outside of the porous cups with a piece of fine linen. I used a pair in this manner three years without a particle of copper being deposited on them, and the cups remained as good as new.

I have several other little suggestions which I think might be of practical benefit to young operators, and will write you again if this meets your approbation.

I pity you poor sufferers from the East, and wish you could enjoy this glorious climate, where the thermometer has not reached higher than 80 this summer and at night not higher than 70.

Very respectfully, yours,

JOSEPH M. GOUGH, Manager.

[This class of correspondence we highly value and desire. We welcome all such with a hearty good will. Here is a practical thought, simple in application, highly useful, easily understood by the most inexpert and ignorant, presented in a manner so unpretentious as to challenge general attention. The idea itself is not new, but not the less valuable. It is new to very many. Thank you, Mr. Gough. Write again.—*Ed.*]

◆

A MANAGER AND OPERATOR TEN YEARS OLD.

EASTON, Pa., August 30, 1870.

DEAR SIR: In recent issues of your valuable paper I have noticed some articles on "Youthful Operators." You will perhaps give place to the following, which I do not think has been equalled in this or any other country:

At the age of nine years and six months John E. O'Brien entered the Greensburg, Pa., office as messenger. On the day he was ten years old he took charge of the Hollidaysburg, Pa., office, receiving train orders, commercial business, etc., entirely by sound. At thirteen years of age he entered the "United States Military Telegraph Corps," at Fortress Monroe, doing good service throughout the war (part of the time as cipher operator, Headquarters, Department North Carolina). When fifteen years old I have known him to receive cipher messages of several hundred words from Jesse Bonnell and other fast writers without a break. After close of war he gave up the position of cipher operator, War Department, Washington, at a salary of $1,500 a year, to study medicine, and he is now a practicing physician in Phillipsburg, N. J. L. C.

ANSWERS TO CORRESPONDENTS.

"Will be at Exeter, N. H., Thursday," contains six words.

A man may be a thorough electrician without being able to send or receive a message on the telegraphic instruments now or heretofore in use. A thorough knowledge of electrical science does not imply a specific acquaintance with all the practical uses to which electricity has been applied. A man, for example, may be a thorough mechanician, and yet not be able to perform the duties of a practical artisan in many branches of the mechanical arts. A thorough telegrapher ought to be well posted in electricity, but a man may be an expert transmitter and receiver of messages upon a telegraphic instrument without possessing any knowledge whatever of the science of electricity.

A wire extending from A to G, and having intermediate stations at C and D, is reported to conduct itself in the following absurd manner: A wants to send a message to G but cannot raise him, and therefore sends it to C, who walks over to D (a distance of one mile) and sends it to G. The operator at D can hear A by adjusting high, but cannot break him. Circuit is good from A to C and from D to G, and the line is apparently all right from C to D, but at several different times it has mysteriously and persistently refused to work through.

The explanation of the diffiduty is that a ground connection exists at some point between C and D. Very likely it will be found in either C or D office, and perhaps in a defective lightning arrester, which not only arrests more lightning than it was intended to, but runs it into the ground, thus signally interfering with the signals. When this occurs again let D cut the wire leading to A outside of his office. If he then gets G, the wire will be found grounded in his own office; but if by cutting the wire the circuit between D and G is open, then the ground is between the outside of his office and C. In this case let C cut the wire leading to A outside of his office. If he then gets A the wire will be found grounded in his own office; but if after cutting the wire the circuit between D and G is left open, the ground must be looked for between C and D, and a fine wire will very likely be found attached to a pole and extending from the line to the ground.

"Suppose a message to be addressed to John Smith, Thomas Jones, *and* William Johnson, is it the duty of the receiving office to make more than one copy? Should it be checked as one or three messages?" The three copies should be made and delivered, and each copy checked and paid for.

All companies, corporations, or individuals, are entitled by law and custom to make such proper and reasonable rules and regulations as are necessary for their security in the performance of their occupations or in the transaction of their business. The Western Union Company has made a rule requiring that all messages to be transmitted over their lines must be written upon the printed blanks of the company, or be attached to the face of the blank by the person presenting it. The Courts have decided that this is a just and reasonable rule, and there is no reason why it should not always be willingly complied with.

◆

New Zealand Telegraph.—The construction of a line of telegraph between Tauranga and Taupo has been commenced. The line is expected to be completed in about two months. By the end of this year it is expected that every settlement of importance in the north island of New Zealand will be connected by telegraph.

Enterprising Journalism.—The Atlantic Cable dispatch containing a full account of the great battle of Gravelotte sent to the New York *Tribune* and published in that paper on the 24th ult., is probably the longest and most costly dispatch ever sent over the trans-continental wires. It cost the *Tribune* $2,260 in gold. As a specimen of enterprising journalism this is absolutely unprecedented, but it may be surpassed ere the war closes. The slow moving dailies of London and other foreign cities will stand wide-mouthed with astonishment at the absolute disregard of expense shown by their American cotemporaries in obtaining news. We doubt whether any of them ever paid as much for news in an entire week as the *Tribune* paid for this single dispatch.

◆

An Improvement in Galvanic Batteries.—Mr. W. Poole Levison of Cambridge, Mass., in a letter to the *Journal of the Franklin Institute* says: "In the spring of 1869, while making use of a small bichromate of potash battery I discovered that the addition of nitric acid to the mixture of potassic bichromate and sulphuric acid, contained in its porous cups, conferred upon it the virtue of *steadiness*, without involving the evolution of annoying fumes. For over two months, during last summer, I had in almost constant action a combination of twenty-three large Bunsen cells charged with dilute sulphuric acid and the triple mixture mentioned, and "set up" openly upon the floor of my room. Not only did I work about it with perfect comfort but left choice brass instruments in its immediate neighborhood with impunity. Its energy never fluctuated, but after remaining for some time steady declined, precisely as if the electro-negative plates were bathed in nitric acid only. To a cooled mixture of potassic bichromate solution and sulphuric acid (perhaps preferably in atomic proportions) add *nitric* acid. The proportion of nitric acid may be greatly varied, as its office is merely to transfer oxygen."—[*Chemical News.*

◆

Galvanic Battery.—E. D. McCracken, New York City.—*Aug* 16.—The object of this invention is to obviate the difficulty and inconvenience which result from the failure of continuity of action of galvanic batteries and the consequent necessity for frequent renewal of the chemicals. The invention is more especially advantageous in its application to what is known as the "Electropoion" battery, but may be applied in connection with batteries of other kinds. It consists in the combination of two or more batteries and a switch, which is so arranged relatively to them as to allow either of the said batteries to be brought into the circuit of the telegraph line or other apparatus worked by the battery, the other or others being, at the same time, thrown out of the circuit with their poles open. The switch being operated at regular or suitable intervals to bring each battery in turn into operation, and the other or others, out of operation, each is in turn during the suspension of its operation allowed to recover its strength and activity, while the circuit remains always in working order.

◆

Mr. Simmonton, on behalf of the N. Y. Associated Press, has closed contracts with the Reuter Telegraph Company, the Continental Telegraph Company of Berlin, and the Havas, Bullier & Co. Agency of Paris, for the exclusive use in America of all the news obtained by those three great companies.

◆

The Isle of Man has been included within the British Postal Telegraph Service. This island is spoken of as Napoleon's future home.

Australian Telegraphy.—Mr. Douglas, agent general for Queensland, has been instructed to secure the laying of a submarine cable to Normanton, at the head of the Gulf of Carpentaria. The object is to insure a double line of communication.

◆

Have Compassion on the Telegraphers.—Let up on them. Don't button-hole and "buzz" them for the news on every corner. They don't have any too much time in which to eat their meals. Don't bore them by asking questions in the office about the war news. They don't know anything about it and don't expect to. Let the operators die a natural death. If you can't wait till the papers are out for the details of the last battle between the Horse-steakers and the Limburghers, go over and enlist on one side or the other. Every word of military intelligence that passes through the telegraphers' hands belongs to the newspapers of the Associated Press, and they have no more authority to divulge it than the postmaster has to tell you the contents of a sealed letter. Let the telegraphers have peace!—*Utica Observer.*

◆

An Iron Telegraph Pole.—A correspondent of the *Iron Age* gives the following description of a patent telescopic tubular iron telegraph pole, invented by Mr. E. F. Prentis of Philadelphia: "The pole is made of the best wrought iron, in three tubular sections of eight feet each for city use, and but two for country. These sections are ingeniously connected by 'reducing couplings,' and are of the following diameters: At the bottom, two and a half inches; second section, two inches; and third, one and a half inch. The base attached is fifteen inches in diameter, with four lugs attached, each four inches square, with inch-and-a-half holes at the extremity of each lug, for the purpose of dogging or keying in soft marshy ground. The pole, light and airy as it appears, will stand a pressure sufficient to raise a weight of 1,000 lbs. from the base of the apex, and weighs, including base, but 125 lbs. Being telescopic, the upper sections sliding into the lower one, it occupies for transportation a space of only eight feet long by its diameter. It is evident at a glance that this invention must prove highly serviceable as well as valuable. All the objections of decay, overthrow by wind, expense and difficulty of transportation, owing to bulkiness, and great cost in timberless or mountainous countries, which appertain to the wooden pole, are overcome and avoided in this invention. It possesses simplicity, lightness, durability and economy, and is destined to be of great assistance to the extension of telegraphic communication throughout the world. A company purchases the patent for the United States, while an enterprising individual is already negotiating for the right for India and Egypt."

◆

The Montreal Telegraph Company.—The progress of telegraph enterprise is a striking indication of the progress of this country. It is little more than twenty years since the Montreal Company put up the first telegraph poles in Upper Canada, and now their lines form a perfect network all over the country, they so intertwine. They are to be found in every place. Even all the new villages of any importance are in telegraphic communication with "all the world and the rest of mankind." For these advantages the people are chiefly, if not wholly, indebted to the enterprise and enlarged views of Mr. H. P. Dwight of Toronto, who has been for many years Superintendent of the line, with credit to himself and great advantage to the Company. Previous to Mr. Dwight's connection with the Montreal line the business was very limited in Upper Canada.—*Goderich Star.*

Journal of the Telegraph.

This Journal will be issued on the 1st and 16th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway. New York.

NEW YORK, SEPTEMBER 15, 1870.

WESTERN UNION TELEGRAPH COMPANY.

OFFICIAL STATEMENT.

	July. 1869.	July. 1870.
Receipts	$593,670 01	$630,069 69
Expenses	412,895 02	428,012 78
Net profit	$180,774 99	$202,056 91

◆

Executive Office, Western Union Tel. Co.,
September 12, 1870.

Notice is hereby given that the annual meeting of the Stockholders of the Western Union Telegraph Company will be held at the Executive Office of the Company, 145 Broadway, in the City of New York, on the second Wednesday (12th) of October, 1870, at twelve o'clock noon of that day, and for such purpose the transfer books will be closed on the afternoon of the 24th instant and opened on the morning of the 13th October, 1870.

O. H. Palmer,
Secretary and Treasurer.

THE TRUMPET TELEGRAPH.

MR. CRAIG DOES NOT ACCEPT THE CHALLENGE.

As we anticipated, Mr. Craig does not accept Mr. Orton's offer to put one Western Union wire and two Morse operators against his "two hundred per cent. superior wire" and six automatic operators, in a test of speed for the transmission of three thousand words, between Washington and New York; but, instead of this simple method of comparing the merits of the two systems,

MAKES A COUNTER-CHALLENGE,

which for modesty, relevancy and appropriateness, is only paralleled by John Phœnix's humorous counter pistol-shooting challenge, as the following choice extracts will show:

THE MORSE SYSTEM PERFECT.

"It is now a quarter of a century since the Morse system of telegraphy was crudely introduced in this country, yet, thanks to the many talented operators and machinists who have been employed by the Western Union Company, it has been greatly improved year by year, until it has probably become as perfect as human ingenuity will ever make it.

THE AUTOMATIC SYSTEM STILL UNBORN—ITS NURSE FEARFUL OF ITS LIFE.

"Our automatic system of telegraphy, unlike the Morse, is yet undeveloped; indeed, it can hardly be said to be born, and if its nurse succeeds in saving the life of the innocent, surrounded as it is with ignorance, falsehood, selfishness, and all the baser passions of interested Morse enemies, I expect to live long enough to see the *Official Journal* and its amiable and excellent editor making a second appeal to the charity of the craft for means to raise a second collossal statue in the Park, to be placed, let me hope, on the opposite side from the statue destined to perpetuate the fame of one who did not invent the telegraph, but who did claim to have invented electricity, and made a vigorous legal fight against the testimony of the Almighty and Dr. Franklin to sustain the impious claim."

TWO THOUSAND WORDS TOO SMALL A BITE FOR MR. CRAIG'S VORACIOUS APPARATUS.

"Mr. Orton's challenge for the complete transmission and delivery of 2,000 words from Washington to New York, would only offer to our wire and our varacious transmitting and recording motor employment for about four minutes and thirty seconds, which is too short a test of our new system."

MUNCHAUSEN'S FEATS OUTDONE.

"We have a single wire and a single transmitting motor which a child can manage, capable of dispatching from Washington to New York from twenty to thirty thousand words per hour, or three hundred and fifty to five hundred words per minute."

THE CRAIG SYSTEM, AT ONE STRIDE, SURPASSES THE DOG CART AND LAME DONKEY.

"The Morse incubus has at last been thrown off from the telegraph brain of the country, and henceforth there will be progress in that science. At one stride we have gone as much beyond the Morse system in practical telegraphy as a railroad train and locomotive are in advance of the dog cart and a lame donkey."

HAS ONLY A SINGLE LOAF, AND THAT BUT HALF BAKED.

"We have but a single operator who can be said to have given the least attention to the rapid working of our system, and he is, for all that portion of the work which requires hard labor, not more than half as expert as he will become by steady practice for a few weeks."

THE COUNTER-CHALLENGE.

"On my part, and on behalf of the automatic system, I am willing to be bound to make the test over any length of direct circuit of not less than 282 miles of line wire, the wire being connected and in fair electrical condition for use by the Morse machines."

TWELVE-YEAR OLD GIRLS AND BOYS TO PREPARE THE MESSAGES FOR TRANSMISSION.

"The perforating of the paper, preparatory for transmission through the transmitting motor, shall be done by girls or boys from twelve to sixteen years of age."

MESSAGES RECEIVED BY CHILDREN UNDER SIXTEEN AND TRANSMITTED BY INFANTS OF TEN.

"The receiving or recording motor shall be managed by a girl or boy not over 16 years of age.

"The transmission of messages shall be wholly accomplished, so far as the management of the transmitting motor is concerned, by a girl or boy of the age of ten years."

AUTOMATIC MACHINERY TO COST ALMOST NOTHING.

"Our automatic or hand machinery shall cost no more to make than the Morse machinery, reference being had to what the machinery will accomplish."

PROMISES TO BOTTLE UP HIS INVENTOR AND GET READY FOR THE TEST IN FOUR MONTHS.

"We will invent no new machinery, and will complete the needful machines for the proposed test within four and probably within two months."

OFFERS TO BET HALF A MILLION ON FOLLOWING CONDITIONS.

"*First*—That we can transmit from Washington to New York, over one wire, more matter, and at a less total cost, and with greater accuracy and certainty, than can be performed by the Western Union Company. The test to be for not less than ten hours, nor more than two days. We will make good this claim by depositing $25,000 with an equal amount by Mr. Orton.

"*Second*—We will then double the deposit and do the telegraphing at a saving, as compared with the Morse system, of ten per cent.

"*Third*—The same amount of deposit by both parties, and we to show a saving, as compared with the Morse system, of twenty per cent.

"*Fourth*—The same amount of deposit, and we to show a saving of thirty per cent.

"And so on in advance of ten per cent. up to seventy per cent. of savings by the 'Little' over the 'Morse' systems."

HEAVY ODDS AGAINST THE HUMASTON APPARATUS.

"Mr. Orton has stated that our system was neither new nor valuable, and that the Western Union Company has in the Bain-Humaston automatic machines all that we can lay claim to. I propose that he shall test his machines on 25,000 words of intelligence, to be perforated and transmitted from Washington to Albany or any other direct circuit of 500 miles—he to use one perforator and one wire, and we to do the same—both parties to deposit with a mutually satisfactory committee $10,000. If we do not accomplish the perforation, transmission and writing out by our system in one-half the time that Mr. Orton does he may take our money. If we do we will take his, and we will then double the amount of deposit and be bound to accomplish the whole work four times quicker than it can be done by Mr. Orton with his Bain-Humaston machine."

THE STOCKHOLDERS IN CRAIG'S LINE SURE OF A BIG THING.

"Mr. Orton seems greatly concerned for fear that somebody may be 'taken in' by my 'sonorous prophecies.' Let Mr. Orton join me in depositing $10,000 with some acceptable party, and if, after twelve months, and for five years thereafter, we do not earn and pay to our stockholders ten per cent. of dividends for every one per cent. that may be earned and paid by Mr. Orton's company, he may claim my deposit—I taking his if I win."

(*From Phœnixiana.*)

PISTOL SHOOTING CHALLENGE.

Owing to the frequent and urgent solicitations of many of my friends, I am induced to make the following propositions:

1. I will fit a dollar to the end of a twig two inches long, and while a second person will hold the other end in his mouth, so as to bring the coin within an inch and a half of his face, I engage to strike the dollar, three times out of five, at the distance of ten paces, or thirty feet. I will add in explanation, that there are several persons willing and ready to hold the twig or stick described above, when required.

2. I will hit a dollar, tossed in the air, or any other object of the same size, three times out of five *on a wheel and fire*.

3. At the word, I will split three balls out of five, on a knife blade, placed at the distance of thirty feet.

4. I will hit three birds out of five, sprung from the trap, standing thirty feet from the trap when shooting.

5. I will break, at the word, five common clay pipe stems out of seven, at the distance of thirty feet.

6. I engage to prove, by fair trial, that no pistol-shot can be produced who will shoot an apple off a man's head, at the distance of thirty feet, oftener than I can. Moreover I will produce two persons willing and ready to hold the apple on their heads for me, when required to do so.

7. I will wager, lastly, that no person in the United States can be produced who will hit a quarter of a dollar at the distance of thirty feet, oftener than I can, *on a wheel and fire*.

I am willing to bet $5,000 on any of the above propositions, one-fourth of that amount forfeit. So soon as any bet will be closed, the money shall be deposited in the Bank of the State of Missouri, until paid over by the judges, or withdrawn, less forfeit. I will give the best and most satisfactory references that my share will be forthcoming when any of my propositions are taken up. Any one desiring to take up any of my propositions must address me by letter, through the St. Louis Post-Office, as the advertisements or notices of newspapers might not meet my eye. Propositions will be received until the first of September next.

Edmund W. Paul,
140 Sixth street, between Franklin avenue and
Morgan street, St. Louis, Missouri.

COUNTER CHALLENGE BY JOHN PHœNIX.

I am unable to see anything very extraordinary in the above propositions by Mr. Edmund W. Paul. Any person, acquainted with the merest rudiments of the pistol, could certainly execute any or all of the proposed feats without the slightest difficulty.

"Owing" to my entertaining these opinions, "without solicitation from friends, and unbiassed by unworthy motives," *I* am induced to make the following propositions:

1. I will suspend *two* dollars by a ring from a second person's nose, so as to bring the coins within three-fourths of an inch from his face, and with a double-barreled shot-gun, at a distance of thirty feet, will blow dollars, nose and man at least thirty feet further, four times out of five. I will add, in explanation, that, San Diego, containing a rather intelligent community, I can find, at present, no one here willing or ready to have his nose blown in this manner; but I have no manner of doubt I could obtain such a person from St. Louis, by Adams & Co.'s Express, in due season.

2. I will hit a dollar, or anything else that has been tossed in the air (of the same size), on a wheel, *on a pole or axletree, or on the ground*, every time out of five.

3. At the word, I will place five balls on the blade of a penknife, and split them all!

4. I will hit three men out of five, sprung from obscure parentage, and stand within ten feet of a steel-trap (properly set) while shooting!

5. I will break at the word, a whole box of common clay pipes, with a single brick, at a distance of thirty feet.

6. I engage to prove by a fair trial, that no pistol-shot (or other person) can be produced, who will throw more apples at a man's head than I can. Moreover, I can produce in this town more than sixty persons willing and ready to hold an apple on their heads for me provided they are allowed to eat the apple subsequently.

7. I will wager, lastly, that no person in the United States can be produced, who, with a double-barreled shot-gun, while throwing a back-handed summerset, can hit oftener, a dollar and a half, on the perimeter of a *revolving* wheel, *in rapid motion*, than I can.

Any one desiring to take up any of my propositions, will address me through the columns of *The Pioneer Magazine*. Propositions will be received on the first of April next.

JOHN PHŒNIX.

1294 Seventeenth Street, Vallecitos.
"*Se compra oro aqui*, up stairs."

P. S. Satisfactory references given and required. A bet from a steady, industrious person, who will be apt to pay if he loses, will meet with prompt attention.

J. P.

THE EUROPEAN DISPATCHES.

The Press Dispatches from Europe to New York, during the last four weeks, numbered about 100,000 words. New York has been better posted on the issues of the war each day than London, Paris, or Berlin. These dispatches have almost wholly been sent by a single cable, full one-third of the whole to a single daily paper, and with marvellous rapidity and accuracy. Familiar as we are with the work of the telegraph, it has been a marvel to us. To hundreds of thousands of minds the whole process is and has been a deep enigma.

Here is a man sitting in a darkened room at Heart's Content. The ocean cable terminates here. A fine wire attached thereto is made to surround two small cores of soft iron. As the electric wave, produced by a few pieces of copper and zinc at Valentia, passes through the wire these cores become magnetic enough to move the slightest object. A looking-glass, half an inch in diameter, is fixed on a bar of iron one-tenth of an inch square and half an inch long. On this tiny glass a lamp is made to glare so that its light is reflected on a tablet on the wall. The language of the cable is denoted by the shifting of this reflected light from side to side. Letter by letter is thus expressed in this flitting idiom in utter silence on the wall. There is no record made by the machinery except as the patient watcher calls out to a comrade the translated flashes as they come, and which he records. It seems a miracle of patience. There is something of awe creeps over us as we see the evidences of a human touch three thousand miles away swaying that line of light.

By such a delicate process as this, and after being repeated from line to line five times before its ultimate copy is in New York, have the late great battles been recorded in our daily papers with great particularity and sent throughout the Union. Nothing like it has ever before been accomplished. The enterprise of the New York Press, of a single press in New York, has eclipsed that of the wealthiest and ablest presses in Europe. It is characteristic of the nation to do its work grandly and well.

◆

CATCH HIM.

We have received the following very expressive message from Superintendent Temple, which speaks for itself. Let everybody take notice:

"VINCENNES, Indiana, Sept. 8, 1870.

"J. D. REID, *Esq.*

"Please notify all superintendents of telegraph lines, in your next issue, to look out for H. L. Marshall, *alias* George T. Fowler. He is tall and slender, has dark hair, ruddy complexion, and good address. *He is a rascal and a thief.*

"C. W. TEMPLE."

Now, Mr. Marshall, the sooner you are in Prussia the better.

◆

THE MONTREAL TELEGRAPH COMPANY are about erecting a large four-story building in Toronto, for the comfortable transaction of its large and growing business.

◆

MR. GEORGE W. BALDWIN, the efficient Manager of the Atlantic Cable Room, No. 145 Broadway, New York, left the service, Sept. 6, to enter upon new engagements in Texas. He carries with him the hearty good wishes of all his associates, and the respect and benediction of the officers he has so faithfully served.

◆

MR. FREDERICK H. SEIBERT, for many years an operator at No. 145 Broadway, New York, and one of the originators of the Telegraphers' Insurance, has found it for his interest to engage in other business. We cordially wish him success, and are sorry to part with him.

◆

DISCHARGED.—In the Central Division eight persons are reported as discharged:

For absence without leave	2
For disorderly conduct	1
For insubordination	1
For negligence	2
Incompetent	2

◆

PARIS, Sept. 12.—This evening the employés of the telegraph companies and many others assembled in front of the American Legation, and made another demonstration in honor of the Government of the United States and its representative.

◆

HAVANA, Sept. 12, 1870.—Telegraphic communication has been established between this city and Santiago de Cuba, and the office of the Panama and West India cable was opened to the public for business this morning. The Santiago de Cuba office was also thrown open for the first time for the transaction of public business. Sir Charles Bright will leave Santiago de Cuba to-morrow to lay a cable from that city to Jamaica.

◆

MEN who have acquired scientific education enough to state a case with scientific precision acquire at the same time a generous conviction that there must be no license allowed to the manner of the statement. We have no strong leanings to these scientific ways, and would much rather describe things by their simplest names, and, indeed, take a poetic license in the manner of stating a fact. We know that some people would rather call a horseradish *armoracia*, but we do not; and although it is very incorrect to complain of glass sweating when colder than the atmosphere, yet glass looks very like that in such a case. Let us ease a troubled mind, therefore, by saying that glass never sweats, but contracts dampness, or the moisture of the air condenses upon it when warmer than itself. Now the infant class is dismissed.

◆

TELEGRAPHS IN CHINA.—The Shanghai correspondent of the *Times* writes: "Speaking of telegraphs, we are likely soon to be connected with Europe, despite the puerile exclusiveness of the Government. A Russo-Danish company is bringing down a cable from the Amoor, and the China Submarine Telegraph Company promises to lay a cable to Singapore, Hong Kong, and up the coast to Shanghai in the course of a short time. To neither, I believe, would the Pekin officials allow the right of landing even the shore end of the cable. All they would consent to was the laying of one which should be *bona fide* submerged. They probably thought this would quash the project; but the expedient of hulks can be resorted to. Yet one would think, they must see that no convulsion of nature has followed the erection of telegraph wires in the foreign settlement of Shanghai, where we do not wait to ask permission. Two of the large steam companies have telegraphic communication along two miles of river front between their head offices and their wharves, and the municipal council have connected the several police stations in a similar way. The wire runs through a Chinese population of some 100,000; yet I have not heard that these people, who are represented by their rulers to be so deadly opposed to telegraphs, have even remonstrated or dreamt of regarding the wires otherwise than with curiosity."—*Engineering.*

◆

IN LONDON a project for having another telegraphic cable to America is announced.

◆

J. W. FULLER, late Paris agent for the American Cable companies, has been appointed Manager of the British Australian and China Submarine Company's lines at Singapore.

◆

THE MORSE STATUE.—Our friends will be rejoiced to see the assurance we give to-day of the success of this work. Over two-thirds of the amount needed for the statue proper is now in hand. The artist is also far advanced with his work. The clay model will be complete October 1. Our columns are too crowded to say more to-day. Let our friends push the work along. All goes well.

MORSE TESTIMONIAL FUND.

RECEIVED SINCE LAST ISSUE.

NEW YORK, Sept. 12, 1870.

DEAR SIR: I take great pleasure in handing you the inclosed check for five hundred dollars from the Directors of the New York, Newfoundland and London Telegraph Co., towards the Morse Testimonial, which they cordially approve, and desire to see, as they doubt not it will be, eminently successful. I hope soon to add to this a fair sum from our offices.

Yours truly, H. H. WARD.

Marshall O. Roberts	$100 00	Cyrus W. Field	$100 00
Moses Taylor	100 00	Peter Cooper	100 00
Wilson G. Hunt	100 00		
			$500 00

TOLEDO, WABASH AND WESTERN RAILWAY—SECOND LIST.

DEAR SIR: I have the pleasure to inclose you a draft for $47, an additional "testimonial fund" from this line, making in all a subscription of $95. Allow me to call your attention to the subscriptions of the *Toledo Daily Blade* and *Daily Commercial*. Would not other papers be willing and glad to join in this movement?

Respectfully,

Toledo, O. G. A. BEACH.

We have no question but that every Press in the country would be glad to participate in the memorial service. The Telegraph has made the Press a triumph and a power.

G. A. Beach, supt., Toledo, O.	$5 00
J. H. Boyle, train dispatcher, Toledo, O.	2 00
Stanley Noble, operator, Toledo, O	1 00

F. R. Dewer, operator, Toledo, O.	$1 00
R. B. Habbell operator, Toledo, O.	1 00
E. Chamberlin, operator, Toledo, O.	1 00
James Wright, messenger, Toledo, O.	50
Geo. T Squire, operator, Maumee, O.	1 00
F. M. Hubbard, Maumee, O.	1 00
W. H. Kerr, messenger, Maumee, O.	1 00
E. F. Coulter, operator, White House, O.	1 00
C. H. Lindenberger, operator, Napoleon, O.	1 00
Geo. E Uhley, operator, Napoleon, O.	1 00
C. C. Young, operator, Liberty Centre, O.	2 00
J O. Young, operator, Liberty Centre, O	1 00
J. H. Whitaker, operator, Defiance, O.	1 00
C. G. Lynch, operator, Defiance, O.	1 00
F. Jamison, messenger, Defiance, O.	25
R. Greenfield, operator, Antwerp, O	1 00
P. McGahan, repairer, Huntington, Ind	50
Geo. Taylor, operator, Huntington, Ind.	1 50
D. R. Shafer, messenger, Huntington, Ind.	25
W. R. Adams, operator, Lagro, Ind.	1 00
J. P Murphy, operator, Peru, Ind.	1 00
C. T. Haughey, operator, New Waverley, Ind	1 00
C. E Allen, operator, Logansport, Ind	1 00
William Peters, operator, Logansport, Ind.	1 00
C. D. Camp, operator, Delphi, Ind.	1 00
B. S Voorhis, operator, Buck Creek, Ind	50
F. M. Snook, operator, Buck Creek, Ind	1 00
W. G. Cook, operator, West Lebanon, Ind.	1 00
Miss Nettie Mann, operator, Attica, Ind	1 00
Miss A. Dunlap, operator, West Lebanon, Ind.	1 00
Miss A. Zeur, operator, Roanoke, Ind	1 00
R. J. Nelson, operator, West Point, Ind.	1 00
W. J. Logan, operator, Danville, Ill.	1 00
W. D. Hall, operator, Danville, Ill.	1 00
R. W. Allen, operator, Danville, Ill	1 00
F. M Welch, messenger, Danville, Ill.	50
S. Von Rensallaer, Maumee, O.	50
W. K Pearson, Maumee, O.	50
Toledo Daily Blade, Toledo, O	2 00
Toledo Daily Commercial, Toledo, O.	2 00
	$47 00

Many thanks, friend Beach, for your interest in the matter.

FROM PORTLAND, MAINE.

DEAR SIR: Please accept the following contributions for the "Morse Testimonial:"

Chas. D. Livermore, mgr.	$3 00	Ed. P. Shaw, opr.	$1 00
M. P. Austin, night mgr.	2 00	Joseph H. Wentworth, bookkeeper	2 00
D. C. Shaw, opr.	1 00	Herbert Brackett, clerk	1 00
Jared Crane, opr.	1 00	Nathan Cobb	1 00
James Malone, opr.	2 00	A. W. Booker	50
Samuel W. Eldridge, opr.	1 00	Eleazer Ring, M. Exch	1 00
Ed. W. A Rand, opr.	1 00		
Jas. E Crane, opr.	1 00		

Eliza M. Talbot, manager, Rockport, Me.	1 00
D. P. Livermore, manager, Hallowell, Me.	5 00
Messengers F. M. Ingalls, John H. Dougher, Patrick Herbert, Eddie S. Merrill, P. McDonough, James A. Dougher, Peter Masterton, Frank De Craney, 25 cents each	2 00
	$36 50

MAINE sent us by BANGOR the first generous offering to the Morse Fund. We hope yet to receive something from every office in that good State.

FROM OHIO.

DEAR SIR: Inclosed find draft for $14 50, to be credited as follows. We would all be glad to make amount larger.

JAMES LYTLE, Manager, Newark, O.

James Lytle, manager, Newark, O.	$1 00
E. J. Cauby, operator, Newark, O.	1 00
W. H. Tyhurst, operator, Newark, O.	1 00
E. J. Evans, operator, Newark, O.	1 00
Barney Sheridan, veteran repairer, Newark, O.	1 00
Frank Anderson, messenger, Newark, O.	50

Lake Erie Division B. & O. R. R., of which I have charge, contributes as follows:

J. R. Alsdorf, operator, Utica, O.	$1 00
Charles E. Wire, operator, Mount Vernon, O.	1 00
John W. White, ex-messenger, Mount Vernon, O., veteran	1 00
M. P. Howes, operator, Fredericktown, O.	1 00
S. O. Howes, operator, Fredericktown, O.	1 00
Mrs. Mary J. Watkins, operator, Mansfield, O	1 00
Miss Maggie J. Butler, operator, Plymouth, O.	1 00
Master C. C. Butler, operator, Plymouth, O.	1 00
	$14 50

CENTRAL RAILROAD OF NEW JERSEY.

J. D. REID, *Esq.*

DEAR SIR: The following operators of the Central Railroad of New Jersey cast their mites for the "Morse Testimonial" with hearty wishes for its success:

A. C. Hoffman, Phillipsburg, N. J.	$1 00
John M. Odenwelder, Bloomsburg, N. J.	1 00
J. J. Cyphers, Hampton, N. J.	1 00
F. R. Pennington, Hampton Junction, N. J.	1 00
Joseph Garrison, Hampton Junction, N. J.	1 00
John H. Miller, Clinton, N. J.	1 00
A. T. Bray, North Branch, N. J.	1 00
H. L. Smith, Bound Brook, N. J.	1 00
W. H. Hagenbuch, Dunellen, N. J.	1 00
C. H. Schermerhorn, Plainfield, N. J.	1 00
George M. Lane, Westfield, N. J.	1 00
A. M. Smith, Bergen Point, N. J.	1 00
W. W. Forbes, Elizabeth, N. J.	1 00
J. S. Allen, Crawford, N. J.	1 00
Thomas E. Quinn, Eastport, N. J.	1 00
	$15 00

PENNSYLVANIA.

MAUCH CHUNK, Pa.

DEAR SIR: Inclosed please find $12 from the boys of this section for the Morse Testimonial. Yours, E. R. EBERLE.

Joe. Gould, Mount Carmel, Pa.	$1 00
J. W. Clark, Hazleton, Pa.	1 00
M. B. Fowler, Hazleton, Pa.	1 00
A. M. Eby, Hazleton, Pa.	1 00
J. W. Hyndman, Mauch Chunk	1 00
Geo. McMullen, Delano	1 00
F. P. Lentz, Packerton	1 00
F. J. Armstrong, Quakake	1 00
P. J. Ferguson, Shenandoah	1 00
A. N. Arms, Mauch Chunk	1 00
C. R. Eberle, Mauch Chunk	1 00
J. A. Remmel, clerk, Mauch Chunk	1 00
	$12 00

FROM MARYLAND.

TENTH DISTRICT, EASTERN DIVISION, WESTERN UNION TELEGRAPH COMPANY.

J. D. REID, *Esq.*

DEAR SIR: We of the Tenth District, E. D., take pleasure in inclosing our mite toward the good work. Let it go forward. Should it fall short, *call again*. Yours,

A. G. Davis, Superintendent, Baltimore, Md.	$10 00
G. T. Kohlenberg, Adamstown, Md.	1 00
J. Cassiday, Altamont, Md.	1 00
S. B. Stidham, "	1 00
S. D. Sprigg "	1 00
W. McKinney, Annapolis Junction, Md.	1 00
W. F. Blake, Benwood, W. Va.	1 00
H. Craig, operator, Camden Station, W. Va.	2 00
C. Clawoe, " " "	1 00
J. E. Spinner, " " "	1 00
T. A. Dailey, " " "	1 00
Anon, " " "	1 00
T. Cannon, repairer, " "	1 00
C. Adams, messenger, " "	50
E. Davis, " " "	50
E. Bussard, " " "	50
C. A. Woodward, operator, Cameron, W. Va.	1 00
J. Cunningham, " " "	1 00
J. Householder, repairer, " "	1 00
J. L. Baker, operator, Central Station, W. Va.	1 00
R. E. Post, operator, Clarksburgh, W. Va.	1 00
J. Farnsworth, operator, Clarksburgh, W. Va.	1 00
A. R. Carroll, " Cornwallis, W. Va.	1 00
L. T. Graham, " " "	1 00
D. Lorenstein, " Cranberry, "	1 00
D. F. Mason, " " "	1 00
O. M. Deetz, " Cumberland, Md.	2 00
A. Shriver, " " "	2 00
F. W. Fitschutz " " "	1 00
F. Rizer, messenger, " "	50
E. Hardesty, repairer, " "	1 00
T. H. C. Worton, operator, Doe Gully, W. Va.	1 50
M. C. Leltish, operator, Eaton's Station, W. Va.	1 00
D. A. Mudee, " " " "	1 00
C. F. Kreh, " Frederick, Md.	2 00
F. B. Miller, " Frederick Junction, Md	1 00
John F. Legge, " " " "	1 00
J. C. Cornbright, operator, Glover's Gap, W. Va.	1 00
O. B. Scott, operator, Grafton, W. Va.	1 00
A. A. Swingle, operator, Hancock, Md.	1 00
H. N. Smith, Hancock, Md.	1 00
J. W. Pace, operator, Irondale, W. Va.	1 00
F. Benner, operator, Martinsburgh, W. Va.	2 00
J. A. Englelth, operator, Martinsburgh, W. Va.	1 00
J. W. C. Day, messenger, Martinsburgh, W. Va.	50
James Riley, operator, No. 12, W. Station, W. Va.	2 50
O. E. Ransford, operator, Parkersburgh, W. Va.	3 00
J. Ryan, " " "	1 00
D. E. Clugmars, " " "	1 00
W. Wishart, " " "	1 00
M. Ryan, messenger, " "	50
F. W. Reitz, operator, Petroleum, W. Va.	2 00
A. E. Keefer, operator, Piedmont, W. Va.	1 00
C. R. Tracey, messenger, Piedmont, W. Va.	50
T. P. Mullinix, operator, Plane No. 4, Md.	1 00
Wm. Mullinix, operator, Plane No. 4, Md.	1 00
J. Miles, messenger, Plane No. 4, Md.	25
J. W. Howser, operator, Relay House, Md.	1 00
W. W. Schoch, operator, Rowlesburg, W. Va.	1 00
H. Tabb, operator, Rowlesburg, W. Va.	1 00
J. L. Burucker, operator, Sandy Hook, W. Va.	1 00
J. M. Marquette, operator, Sandy Hook, W. Va.	1 00
H. S. Williams, operator, Strasburgh, W. Va.	1 00
F. T. Bueck, operator, Volcano, W. Va.	2 00
G. W. Strickler, operator, Weston, W. Va.	1 00
John Cline, operator, Mount Savage, Md.	1 00
E. N. Woodhouse, operator, Locust Point, Md.	1 50
	$84 00

MINNESOTA.

DEAR SIR: From a few of our Minnesota operators I have the honor of remitting you $25 50 to represent us in the "Morse Testimonial." If further contributions are needed, advise me. We want the tribute to be a credit to the fraternity as well as worthy the man we delight to honor.

St. Paul, Minn. O. C. GREENE.

ST. PAULS CITY.

J. W. Crouse	$1 00	C. H. Pelsch	$1 00
Ed. Curry	1 00	T. E. Clark	1 00
F. B. Jilson	1 00	Geo. Harris	1 00
C. E. Hughes	1 00	James Harris	1 00
J. E. Caldwell	1 00	Frank Mitsor	50
O. C. Greene	1 00	George Fitch	50
W. H. Gridley	1 00		

S. S. Ulmer, St. Anthony	1 00
A. J. Elliott, Minneapolis	1 00
H. R. Tennant, Wayzata	50
P. D. Putnam, Long Lake	50
W. H. Landis, Delano	1 00
C. J. Fisher, Smith Lake	50
J. W. Glassford, Darwin	50
A. B. Robbins, Willmar	50
Q. C. W. Richardson, Litchfield	1 00
F. M. Thornton, Benson	1 00
L. J. Baker, St. Anthony Junction	1 00
W. F. Arnold, Anoka	1 00
H. J. Hoebner, Elk River	1 00
R. D. Bloomfield, St. Cloud	1 00
S. A. Putnam, Big Lake	50
C. Coborn, Sauk Rapids	50
Wint Delano, Sauk Rapids	50
William Inks, Crow Wing	50
	$25 50

Our reply to Mr. Greene is, let every man be invited to join in this National Testimonial. The more money, the more complete will be the work.

INDIANA.

INDIANAPOLIS, Sept. 5, 1870.

JAMES D. REID, *Esq., Chairman, &c., New York.*

DEAR SIR: Inclosed please find transfer on John Horner for one hundred and eighteen dollars, account Morse Testimonial, from the following contributors, to which I hope to make considerable additions soon.

If the *pockets* corresponded with the *good will* of the fraternity, there would be no trouble in raising a monument to the "Father of the Telegraph" as high as "Ossa upon Pelion;" but, unfortunately, in too many cases, the purse is as weak as "the spirit is willing." Yours, truly,

CHAS. C. WHITNEY.

INDIANAPOLIS.

John P. Wallick, Dist. Supt.	$5 00	Geo. Weakly, opr.	$1 00
Charles C. Whitney, manager	1 00	Z. P. Hotchkiss, opr.	1 00
Richard C. Duncan, chief operator	1 00	J. A. Fuller, opr.	1 00
D. C. Hinsdale, opr.	1 00	T. H. O Neal, opr.	1 00
Alfred Winder, opr.	1 00	J. C. Wilson, opr.	1 00
		Wm. P. Watson, opr.	1 00
		John G. Blake, dep. clerk.	1 00

TERRE HAUTE, INDIANA.

E. L. Norcross, man'gr.	$2 00	Fred. Baldwin, opr.	$1 00
Charles D. Hay, opr.	1 00	A. Summers, repairer	1 00
E. A. Towslee, opr.	1 00	Geo. F. Seeman, mess'gr.	1 00

RICHMOND, IND.

M. D. Butler, manager	$1 00

NEW ALBANY, IND.

Geo. H. Godfrey, man'gr.	$1 00	Tim Cleary, repairer	$2 00

LAFAYETTE, IND.

H. E. Doolittle, man'gr.	$1 00	James K. Goodwin, opr.	$1 00
F. A. Randall, opr.	1 00		

CLEVELAND, COLUMBUS, CINCINNATI AND INDIANAPOLIS RAILWAY.

I. N. Hoover, general offices, Indianapolis	$1 00

TOLEDO, WABASH AND WESTERN RAILWAY.

Geo. B. Roach, train dispatcher, Lafayette	$1 00
T. B. Cook, operator, Lafayette	1 00
R. W. Waterman, operator, Lafayette	1 00
W. V. Stephens, operator, State Line, Ind	1 00

LAKE SHORE AND MICHIGAN SOUTHERN RAILWAY.

W. H. Weller, La Porte, Ind	$2 00
John Murphy, New Carlisle, Ind	1 00
Peter Shafer, Mishawaka, Ind	1 00
John McDonald, South Bend, Ind	1 00

INDIANAPOLIS, PERU AND CHICAGO RAILWAY.

Phil. Deneher, Kokomo, Ind.	$1 00
A. M. Baker, Noblesville, Ind.	1 00
E. S. Crull, Noblesville, Ind.	25
L. O. Clifford, Cicero, Ind.	1 00

INDIANAPOLIS, CINCINNATI AND LAFAYETTE RAILWAY.

C. E. Tweed, Morris, Ind.	$1 00
M. A. Ashton, Sunmans, Ind.	1 00
J. W. Powers, Greensburg, Ind	50
J. H. Bishop, Shelbyville, Ind.	50
A. J. Avery, "	1 00
Mrs. A. J. Avery, "	1 00
B. S. Sutton, Fairland, Ind.	1 00
C. Brown, Shops, Indianapolis, Ind	1 00
Mark K. Weakly, Thorntown, Ind	1 00
T. A. Sanderson, Clark's Hill, Ind.	1 00

PITTSBURGH, CINCINNATI AND ST. LOUIS RAILWAY.

W. B. Commons, operator, Centreville, Ind.	$1 00
A. V. Hodskin, manager, Cambridge City, Ind.	1 00
Thomas Reynolds, operator, Cambridge City, Ind.	1 00
E. Hunsaker, " " "	1 00
Warren Markle, " " "	1 00
Geo. B. Ashands, messenger, " "	25
J. H. Winter, " " "	25
Robt. A. Patterson, ex-optr., " "	1 00
J. W. Carpenter, " " "	1 00
Geo. Roper, manager, Knightstown, Ind.	1 00
W. O. Salis, operator, " "	1 00
J. J. Diffley, manager, Cumberland, Ind.	1 00
A. T. Laughorne, General Offices, Indianapolis, Ind.	1 00

INDIANAPOLIS AND VINCENNES RAILWAY.

W. H. Hamlin, dispatcher, Indianapolis, Ind.	2 00
R. H. Bishop, Mooresville, Ind.	50
A. Harvey, Martinsville, Ind.	1 00
W. S. Mead, Spencer, Ind.	1 00
L. D. Morgan, Spencer, Ind.	1 00
W. B. Hart, Edwardsport, Ind.	1 00
J. M. Jones, Freedom, Ind.	1 00
S. H. Carnahan, Worthington, Ind.	1 00
W. Reed, Marco, Ind.	1 00

TERRE HAUTE AND INDIANAPOLIS RAILWAY.

John E. Simpson, assistant superintendent, Indianapolis.	$1 00
William M. Boyd, dispatcher, Indianapolis	1 00

James M. Fortenburg, operator, Indianapolis	1 00
John E. Ball, operator, Indianapolis	1 00
Orlando Wakefield, operator, Bridgeport, Ind	1 00
John S. Boyd, operator, Clayton, Ind	1 00
Levi D. Stanley, operator, Centerville, Ind	1 00
Andy Ainsworth, operator, Greencastle, Ind	1 00
John V. Martin, " " "	1 00
C. A. Davis, operator, Greencastle Junction, Ind	1 00
J. J. Bucklin, " " " "	1 00
C. A. Hartwell, operator, Reelsville, Ind	1 00
J. B. Harris, operator, Harmony, Ind	1 00
G. E. Jones, operator, Brazil, Ind	1 00
Raymond Kelsey, operator, Brazil, Ind	1 00
J J Webster, Seelyville, Ind	1 00
John P. Lanaert, operator, Terre Haute, Ind	1 00
Charles F. Mount, operator, Terre Haute, Ind	1 00
A. L. Gardner, operator, Terre Haute, Ind	1 00

LOUISVILLE, NEW ALBANY AND CHICAGO RAILWAY.

H. V. Russell, supt. tel.	$2 00	J. T. Stevens	$1 00
Miller Bollard	1 00	C. T. Miner	1 00
Geo. W. Dyer	1 00	T. A. Mayes	50
Ed. Brewer	1 00	R. Wilson	50
C. R. Hathway	1 00	J. M. D. Orrell	50
W. S. McClelland	1 00	H. T. Smallwood	25
Ed. Hendricks	1 00	Thomas G. Glover	50
J. W. Kishlar	1 00	T. S. Lyon	50
Frank Little	1 00	D. Bachtenkircher	50
J. M. Dickson	1 00	S. H. Day	1 00
C. O. Bingham	1 00	John D. Carter	1 00
J. T. Sanders	1 00	J W. Lee	1 00
O. T. B. Smith	1 00	Eugene Conner	1 00
W. H. Canniff	1 00	A. L. Orrell	50
			$118 00

THE SOUTHERN MINNESOTA RAILROAD LINE.

La Crosse, Wisconsin.

Dear Sir: The Southern Minnesota Railroad Line sends greeting from *every office*, and bids the movement God speed. Every man sends a dollar. Inclosed find $16.

Yours truly, J. M. Nye, Sup't.

Here's a hand to all of you. Come in.

J. M. Nye, La Crosse, Wis	$1 00
A. E. Hazzard, Grand Crossing, Minn	1 00
N. Currie, Hokah, Minn	1 00
H. L. Dunham, Hokah Minn	1 00
E. A Case, Houston, Minn	1 00
O. S Hamilton, Rushford, Minn	1 00
W. B Reppy, Whalan, Minn	1 00
G. H. Bontreou, Lanesboro, Minn	1 00
J. A Flint, Spring Valley, Minn	1 00
E L. Conant, Brownsdale, Minn	1 00
F. Benjamin, Brownsdale, Minn	1 00
L. W. Mason, Ramsey, Minn	1 00
H. Kyle, Oakland, Minn	1 00
D. N. Gale, Albert Lea, Minn	1 00
H. M. Foote, Alden, Minn	1 00
A. H. Merwin, Wells, Minn	1 00
	$16 00
As we found $17 in the package, we add	1 00
	$17 00

FROM TEXAS.

We welcome the following list. We knew Texas would not be long behind her sisters:

Houston, Texas.

J. D. Reid, *Esq., Chairman.*

Dear Sir: Subjoined is a list of contributors to the Morse Fund. With their greeting they also send the hope that the days of the great inventor may be prolonged, and his honors multiplied in proportion as the product of his genius has benefited mankind.

P. Mullarkey.

D. P. Shepherd, Supt'd., Houston	$5 00	D. S. Ryan, Waco	$2 00
J. B Russell, Clear Creek	5 00	A. J. Shepherd, Houston	2 00
J. M. Osborne, Navasota	1 00	A. M. Glass, Houston	1 00
T.W. Anderson, Columbus	1 00	C. R. Chase, Houston	2 00
E W. Young, Cypress	1 00	P. Mullarkey, Houston	2 00
M Raphael, Bemond	1 00	J. S. Moore, Houston	2 00
James Norman, Hockley	1 00	F. Bock, Houston	1 00
Tom J. Russell, Beaumont	2 00	E. C. Burke, Indianola	2 00
H. T. Davis, Orange	2 00	J. R. Hooper, Harrisburg	1 00
B. B. Franklin, Benham	1 00		$35 00

BROOKLYN, N. Y.

"Better late than never." We are all happy to contribute to honor one whom we so much respect as Prof. Morse.

Henry L. Hues, Manager.

H. L. Hues	$1 00	T. F. Laughlin	$1 00
Frank Keena	1 00	E. Denzler	50

Messengers.

Wm. Haskins	25	Albert Squires	25
Albert Axtell	25	Thomas Knightdon	25
John Fogarty	25	Joseph Pinkerton	25
A. Rogers	25	Davis Britt	50
			$5 75

WILLIAMSBURGH, N. Y.

With glad hearts we send you our little offering to the "Morse Testimonial."

D. S. Holmes, our gentlemanly landlord	$1 00
John Olfero, ex-messenger	1 00
John Finn messenger	50
Thomas Hayes, messenger	50
Also, yours, truly, Mary E. Bell, manager	1 00
	$4 00

FROM UTAH, MONTANA, &c.

Ed. Conway, Corinne, Utah	$5 00
George F. Brown, Corinne, Utah	3 00
H. O Pratt Corinne, Utah	1 00
W. H. Glascott, Corinne, Utah	1 00
Alf. Brewer, Corinne, Utah	1 00
P. Kearney, Corinne, Utah	1 00
George Stuart, Corinne, Utah	1 00
James Sewell, Corinne, Utah	1 00
L. M. Painter, Corinne, Utah	1 00
W. E. Fredericks, Helena, Montana	2 00
M. Crozall, Salt Lake City, Utah	5 00
Samuel P. Kimber, Ogden, Utah	2 00
J P. Hines, Bryan, Montana	2 00
Charles Day, Bryan, Montana	2 50
H Brundage, Virginia City, Montana	2 00
W. N. Shilling, Malade City, Idaho	1 00
J. A. Thomas, Fort Shaw, Montana	1 00
John Kerns, Wasatch, Utah	2 00
A. C. Farsley, Carter, Wyoming	1 00
T. D. Conway	1 00
Charles W. Moore	1 00
James McDonald	1 00
	$40 00

MISCELLANEOUS.

William I. Reid, New York	2 00
James J. Johnson, operator, Annapolis, Md	1 50
"God bless the venerable Professor, and may he live long, is the fervent prayer of a Rocky Mountain Coyote," Wyoming Ter	1 00
R. J McCartney, Manager Johnston's, Ga	2 00
Otis H. Newell, Wellsville, O	$1 00
W. M. Locke, operator, Honeoye Falls, N. Y	1 00
F. A. W. Salmon, operator, E. Bloomfield, N. Y	1 00
N. R. Farley, Ipswich, Mass	1 00
E. Lord, Lordville, N. J	1 00
E. C Humphrey, Aledo, Ill	1 00
C. F. Barber, Omaha, Neb	1 00
George A. Warfield, Muscatine, Iowa	1 00
Robert D. Bodman, Muscatine, Iowa	50
B. H Ferris, Anita, Iowa	50
F. G. Valeurenx, Chicago, Ill	1 00
J. M. Sloan, Brooklyn, Iowa	50
W. F. Sedgewick, Brooklyn, Iowa	50
J. Fox, De Soto, Iowa	1 00
J. M. Cumber, De Soto, Iowa	1 00
F. H Snyder, Avoca, Iowa	1 00
Emma Staunton, Chicago, Ill	50
Helen Giddings, Chicago Ill	50
C H. Summers, Chicago, Ill	3 00
John W. North, Sag Harbor, L. I	1 00
John H. Mannwaring, Greenport, L. I	1 00
Miss A. E. Hudson, Mattituck, L. I	1 00
Miss A. B. Wicks, Patchogue, L. I	1 00
F. E. Blacker, Brentwood, L. I	1 00
S. Bullock, Northport, L. I	1 00

Shellsburg, Iowa, July 26, 1870.

J. D. Reid, *Esq.*

Dear Sir: I most heartily indorse the suggestion of Mr. G. K. Wolcott in Journal No. 65, July 15, to call on *our own native hills* for a block of marble to be chiseled into a statue of him who all the civilized world and *American operators* in particular delight to honor. Iowa can and will furnish it a block for the base. I cannot approve of your idea of calling upon Italy for the marble, with all due respect for your opinion. If I am not misinformed, my own native State "Vermont" can and I am sure would be willing to furnish a block of marble unsurpassed by any that Italy can produce. If so, I say let it be of American marble as well as by an American artist.

Yours, &c., M. M. Lewis.

◆

Mr. Charles William Lundy has been appointed Chief of the Electrical Staff of the British Indian Extension Telegraph Company at Madras, and proceeded by the Peninsular and Oriental steamer from Southampton, August 20.

◆

BORN.

Fish—In Oxford, N. Y., to John J. Fish, Manager W. U. Telegraph Office, twins, both boys, first edition.

◆

MARRIED.

Gray—Vandoren—At the residence of the bride's father, in Chester, N. J., Sept 8, by the Rev. Jas. F. Brewster, Mr W. N. Gray of Waterloo, N. J., to Miss Mary L. Vandoren, formerly operator at Madison.

Stebbins—Smith—At Watertown, June 16, Mr. Albert C. Stebbins, Manager W. U. Telegraph Office, Waterville, N. Y., to Miss Lizzie C. Smith of Watertown, N. Y.

◆

DIED.

Cobourn—In Jackson, Tenn., on the night of the 14th August, Ona, infant daughter of J. K. (Manager W. U. Tel. Office) and Nannie Cobourn, aged two years, four months and three days.

Accompanying the above notice we acknowledge receipt of an eloquent testimonial of affection toward this child by a friend of the family, which we would gladly publish were it in any proper sense an obituary. It is an expression of personal affection grateful to the parents, but giving no facts which would justify publication. The father and mother, both of whom are skillful operators, have our sincere sympathy, and will, we trust, excuse us in thus declining to do what our own heart would induce us willingly to perform.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
September 15, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Sept. 1, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

Agate, Col., 205 more than Lawrence, Ks.
Arvada, Col., 205 more than Lawrence, Ks.
384 Amite, La., reopened.
77 Annapolis, Md., heretofore an "other line" office.
* Boligee, Ala.
Box Elder, Col., 205 more than Lawrence, Ks.
130 Bronsons, Pa.
437 Camden, Mo., reopened.
347 Dodson, O.
316 Eagle, Wis.
* Eau Claire, Wis.
* Eutaw, Ala.
Fort Harker, Ks., reopened, 100 more than Lawrence, Ks.
Iron Mines, Londonderry, N. S., tariff same as Londonderry, N. S.
87 Jarratt's, Va.
418 Laclede, Mo., reopened.
357 Lenox, Ill.
* Livingston, Ala.
* Mineral City, O., reopened.
41 Perth Amboy, N. J.
87 Pleasant Hill, N. C.
357 Roseville, Ill.
River Bend, Col., 205 more than Lawrence, Ks.
435 Sioux City Junction, Iowa.
348 Sheffield, Ill.
* Toomsuba, Miss.
368 Table Grove, Ill.
316 Troy, Wis.
266 Wetumpka, Ala.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.	*Leaves this Line.*
Boligee, Ala.,	65 4	Meridian Miss.
Eau Claire, Wis.,	10 5 more than Tomah	same as Tomah, Wis.
Eutaw Ala.,	75 5	Meridian, Miss.
Livingston, Ala.,	50 3	Do.
Mineral City, O.,	same as heretofore,	same as heretofore.
Toomsuba, Miss.,	25 2	Meridian Miss.
Bobcaygeon, Ont.,	same as Lindsay, Ont.,	same as Lindsay, Ont.
Eganville, Ont.,	same as Pembroke, Ont.,	do. Pembroke, Ont.
Fingal, Ont.,	same as Durham, Ont.,	do Durham, Ont.

OFFICES CLOSED.

Berkeley Springs, W. Va.; Cincinnati Furnace, O.; Catskill, M. H., N. Y.; Claredon Springs, Vt.; Cresson Springs, Pa.; Frankfort, Ks.; Florence, Ind.; Iowa, Col.; Jordan's W. S. Springs, Va.; Lake, Col.; Little Mountain O.; Mammoth Cave, Ky; Oakland, Md.; Pacific, Iowa; Quitman, La.; Vevay, Ind.; Warren, Athens Co., O; Wesson, Miss.; Glen House, N. H.; Rye Beach, N. H.; White Mountain House, N. H.; Summit House, Mount Washington, N. H.

GENERAL INFORMATION.

ATLANTIC CABLE BUSINESS.

Telegraph service has been suspended in the following departments of France additional to those of which notice has already been given: Nord, Somme, Seine, Pas de Calais, Oise, Seine et Oise.

Messages relative to the supply or equipment of the army are still accepted for Paris, as well as service and press messages. Transit messages are also accepted and forwarded for Switzerland, Italy, Spain, and beyond.

Salt Lake City, Utah, should be included in list of offices given in order taking effect March 10 1870. See "Rate to San Francisco," in Journal of March 1, 1870.

The name of the office heretofore known as Milton, Iowa, has been changed to Malvern, Iowa., and Communipaw, N. J. to Communipaw Stock Yards N. J.

Messages for Communipaw and Lafayette, N. J., may be taken and sent and checked to Jersey City, N. J., at Jersey City rate.

The "tariff for other lines" to Chesnut Hill, Philadelphia, Pa., will hereafter be 85 and 1.

Eureka Coal Mines, Ala., in last Journal, should read Eureka Coal Mines, Ga.

WILLIAM ORTON, President.

◆

Electro-magnetic Low-water Alarm for Steam Boilers.—W. Duryea, Glencove, N. Y.—Aug. 9.—The object of this invention is to provide with greater certainty for the sounding of an alarm at any distance from a steam boiler whenever the water therein shall fall below a certain level. It consists in arranging within or in suitable connection with the boiler a portion of the conductor of an electric circuit, in which there is placed, outside of the boiler, a suitable electro-magnetic call or alarm, and in providing, within the said circuit, a circuit-breaker which is so actuated by a float or other device which depends for its position on the hight of the water in the boiler, that the opening and closing of the circuit shall be produced by the rise and fall of the water above and below the desired level, and that when the water gets below that level the call or alarm shall be sounded.

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

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J. W. Brown,
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W. H. Turner,
J. M. Outten,
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E. L. Thorne,
R. L. Guion,
G. K. Wood,
C. J. Wilson,
J. Lanergan,
N. J. Gibson,
R. Cowell,
A. H. Stewart,
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George G. Hadley,
L. P. Belden,
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C. D. Camp,
M. S. Roberts,
G. W. Roberts,
F. M. Roberts,
G. W. Moore,
J. S. Scobell,
J. S. Henry,
J. P. Golden,
G. W. Baxter,
D. T. Francis,
A. H. Kanode,
J. C. Noye,
J. A. Swift,
J. B. Austin,
E. Rider,
C. E. Moody,
L. H. Lathrop,
W. Connor,
S. M. Hunter,
L. E. Atwater,
T. R. Fox,
P. Fitchett,
R. Wilkinson,
S. K. Rupley,
A. Griggs,
A. H. Adgate,
W. S. Thompson,
B. P. Humphrey,
C. C. Scott,
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H. L. Barbor,
B. D. Hubbard,
Z. Hubbard,
William Ferguson,
William Holmes,
M. E. Bell,
J. E. Skidmore,
J. H. Townshend,
E. A. Cool,
T. A. Graham,
J. V. Van Every,
G. O. Smith, 13 and 14,
T. Brennan,
W. H. Hill,
H. H. Ward,
C. S. Shivler,
W. O. Lewis,
J. Farrell,
A. W. Gordon,
W. Cook,
E. Sammis,
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G. M. Dugan,
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R. W. Marriatt,
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Ira Dewitt,
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J. L. Edwards, 13 and 14
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B. F. Fallett,
W. H. Ashby,
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G. A. Dodd,
W. J. Bodell,
W. J. Dealy,
J. W. Duxbury, 13 and 14
T. J. Tobin,
W. T. Freeman,
G. W. Howe,
W. C. Havens,
E. F. Ludwig,
D. J. Ludwig,
Joseph Beach,
Henry Beach,
D. D. Forbes,
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L. H. Snow,
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J. Knittle,
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J. Fottrell,
W. A. Tinter,
A. H. Copeland,
L. H. Edwards,
D. L. Gilson,
C. O. Rowe,
C. E. Husted,
O. E. Spellman,
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G. M. Reynolds,
B. Stephens,
T. Allen,
A. S. Brown,
A. R. Brewer,
A. B. Chandler,
Charles L. Chase.

ASSESSMENT NO. 13.

C. A. W. Briggs,
W. H. Collins,
Thomas Dolan,
G. K. Wolcott,
N. B. Tapping.

◆

THE LAST HUMBUG is an Atmospheric Telegraph. It is old, and was supposed dead, yet a gold medal has been given by the Royal Institution of Naples to "Signor Guattari" for inventing it. "*Vive la humbug!*"

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NEW HAVEN,
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OFFICE AT FACTORY.

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Electrician of the Company.

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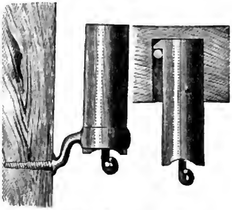

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JOURNAL OF THE TELEGRAPH.

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THE GOOD OF KNOWLEDGE.

A writer in *Fraser's Magazine* asks: Is the pursuit of knowledge, after all, a delusion, the worst and weariest of human mistakes, a thing to which we are driven by our necessities on one hand, and lured to by our thirst for it on the other, but which, nevertheless, like the martyr's cup of salt water, only burns our hearts with its bitter brine?

No! no! a thousand times, no! The mistake has not been in the pursuit of knowledge, but in the reasons we have alleged for that pursuit. We have wooed our beautiful bride for her dower, and not for her own sake, and it is but justice if we discover that that dower, amid its treasures, contains many a snake.

Man *was* created "to know and to contemplate." The *differentia* between him and the lower animals has been stated in many ways; but the most real of all differences is, that he bequeaths from generation to generation (mainly, of course, through written language) his experience and his faith; so that the "heir of all the ages" is the recipient of the whole treasure of time. Each dog is an upstart, a self-made creature. Each man has royal pedigree, and all the sages of the world are his preceptors. His thoughts grow on the grafts of culture. His religious trust is no solitary spring of enthusiasm, starting up alone in the desert; but the flowing stream into whose higher waters all the prophets and apostles have emptied their urns.

This is the true distinction of humanity. All others are matters of degree; degree of cranial development, degree of higher osteological type, degree of faculties of all kinds. One philosopher will say, "man alone is a laughing animal." But the bark of a dog, in its delight of freedom, is the joy-laughter of a child.

Another remarks that man alone is a "cooking animal." But having no hands, the beasts can light no fires, and all which is physically possible they actually effect by burying their food till the four-footed epicure can eat it "high."

Again, a third says that "man alone can speak." But some animals have almost as many sounds as they have wants and ideas, and unlettered savages have little more. It is not till language comes to be written that the analogy stops.

A fourth observes that man alone has the sentiment of pity. But cannibals kill and eat their dying relatives, just as the *carnivora* do; and an affectionate dog has an amount of sympathetic compassion for his master's tears which it is much to be wished his fellow-man should invariably feel.

The fifth claims the sense of right and wrong as the sole prerogative of humanity. But, at least, so far as extends the system which rests morality on rewards and punishments, even the heavy-witted cow has a clear idea that she is doing unlawfully in getting through the hedge into the corn.

Even the sixth grand distinction between man and beast—the religious sentiment—is rather in the object of the feeling than in the nature of it. The Creator has, as it has been often said, made man a god to the beasts. The devotion, humility, fidelity, gratitude, allegiance of a noble dog to a kind master, if not religion itself, is a perfect parable of religion. Fain would we hope that feelings so beautiful—we had well-nigh said, so sacred—must possess immortality, even in the poor fond brute. Is heaven to be a world without any life in it except our own? As well might we suppose it without flowers!

Knowledge, like virtue, is not good because it is useful, but useful because it is good. It is useful contingently, and good essentially. The joy of it is simple; and not only needs not to be supplemented by accessory advantages, but is well worth the forfeit of many advantages to obtain. The most miserable wretch we can imagine is the ignorant convict locked up in a cell, with nothing to employ his thoughts but unattainable vice and frustrated crime, whereon his stupid judges leave him to ruminate, as if such poison were moral medicine, likely to cure the diseases of his soul. And, on the other hand, one of the happiest beings we can imagine is the man at the opposite end of the intellectual scale, who lives in the free acquirement of noble knowledge. What is any "increase of sorrow" incurred thereby compared to the joy of it? To look on the fields of earth and air—not as the dull boor regards them, as mere patches of brown, and green, and blue, with promise of food or shelter, sunshine or shower—but as the geologist, the botanist, the astronomer regards them, each as an infinite world of interest, wherein order, and law, and beauty are tracked by his rapid thought, even as the swallow traces the insect on the wing! To be able to take surveys such as these is to be admitted to a spectacle for which angels might envy the sons of men. But to do yet more, to make memory like a gallery hung round with all the loveliest scenes of nature and all the masterpieces of art; to make the divine chorus of the poets sing for us their choicest strains, whenever we beckon them from the cells where they lie hidden deep in our souls; to talk familiarly, as if they were our living friends, with the best and wisest men who have ever lived on earth, and link our arms in theirs in the never-withering groves of an eternal Academe—this is to be happy indeed. This is to burst the bonds of space and bring the ages together, and lift ourselves out of the sordid dust to sit at the banquet of heroes and of gods.

Is "the increase of knowledge the increase of sorrow?"

◆

MR. GEORGE M. PHELPS, superintendent of the workshops of the Western Union Telegraph Co., New York, has recently brought out and put to use two printing instruments of great simplicity, adapted to private telegraphs for factories, city reporting, and families. One is adapted for two wires, the second for one. Full descriptions of both will soon be given.

NOTES ON ELECTRICAL PHENOMENA.

FROM A COURSE OF LECTURES BY PROFESSOR TYNDALL, LL.D., F.R.S.

Magneto-Electricity: Induced Currents.

207. In a conductor near to, but not in contact with, a voltaic circuit, a current is aroused when the circuit is *established*. When the circuit is *interrupted*, a current is also aroused in the conductor.

208. Thus, supposing the voltaic circuit to be bent into the shape of a ring, and that a second ring, not in the circuit, is placed near the first—at the completion, and at the interruption of the circuit, a current will run round the second ring.

209. The two currents in the second ring are called *secondary* currents. They are of momentary duration. They impart, in passing, a shock to a magnetic needle round which they are sent, and by the motion of which their existence is demonstrated. But they vanish immediately, being quenched by the resistance of the ring and converted into heat.

210. These two momentary currents flow in opposite directions through the the ring. The secondary current, excited on making the circuit, is opposed in direction to the primary exciting current; that started on interrupting the circuit flows in the same direction as the primary.

211. These secondary currents are called *induced currents*. They were discovered by Faraday in 1830, and described by him in his Philosophical Papers for 1831.

212. If, instead of employing a single ring, we make use of an electro-magnetic helix, every coil of the helix will furnish its quota of current, and the sum total of effect is much greater than when only a single ring or coil is employed.

For the following experiments, two flat spirals, each formed of covered copper wire, are used:

213. One of the spirals is laid flat upon a table, its two ends being connected with a galvanometer; the other spiral is connected with a voltaic battery, with which the connection can be established or broken at pleasure. Let us call this the *inducing* or *primary* spiral, and that connected with the galvanometer the *secondary* or *induced* spiral.

214. Laying one spiral upon the other, on sending a current through the primary, the needle of the galvanometer is suddenly driven aside by the current induced in the secondary; but the force which acts upon the needle passes away in an instant, the needle returning to its first position.

215. On interrupting the current the needle also receives a shock, being deflected in the opposite direction. It thus declares the existence of a second temporary current in the secondary spiral. The directions of these two currents, with reference to that of the primary, have been already indicated (Note 211).

216. Holding the secondary spiral at a distance from the primary, with the current flowing through

the latter; on causing the secondary spiral to *approach* the primary, a current is aroused; this current ceases the moment the motion toward the primary ceases.

217. On *withdrawing* the secondary spiral from the primary, a current is also aroused; this current also ceases the moment the motion of withdrawal ends.

218. The current excited by approach is opposed in direction to the primary; the current excited with withdrawal is in the same direction as the primary.

219. Two electric currents flowing in the same direction attract each other; if they flow in opposite directions they repel each other.

220. Hence, to make the secondary spiral approach its primary, we have to overcome a *repulsion;* while to withdraw the secondary from the primary we have to overcome an *attraction.* Thus, in order to produce these induced currents, *we must expend mechanical force.*

221. The force thus expended appears as heat in the secondary wire after the cessation of the induced current. It is the mechanical equivalent of that heat.

222. The approach of a magnetic pole to the secondary spiral, and the withdrawal of the pole from the same spiral, also arouse induced currents; but, as before, it is only during the periods of approach and withdrawal that the current appears.

223. Thus, by the mere motion of a magnet, and without any battery or machine, electric currents may be produced.

224. Every change of the magnetic condition of the space near a secondary coil, or within it, produces an induced current in the coil. If the change be an augmentation of magnetism, the current is in one direction; if it be a diminution of magnetism, the current is in the opposite direction.

225. When a long secondary coil surrounds a primary coil with a core of iron, by breaking and making the circuit of the primary in rapid succession, a series of powerful discharges may be obtained. An automatic apparatus is usually employed to make and break the circuit.

226. Such induction coils have been constructed with great skill by Ruhmkorff, and are, therefore, sometimes called Ruhmkorff's coils. Mr. Apps has recently produced induction coils of astonishing power.

227. The power of a coil depends mainly on the perfection of the insulation of its coils. The induced currents in a Ruhmkorff's coil may possess thousands of times the electro-motive force of the primary which excites them. They are able, for example, to overleap, as sparks, distances thousands of times greater than that possible to the primary.

Relation of Induced Currents to the Lines of Magnetic Force—Rotatory Magnetism.

228. The foregoing phenomena and principles were all laid bare by Faraday. He also established most important relations between his induced currents and the lines of force surrounding a magnet. (See Note 25.)

229. He proves that when a conductor moves *along* the lines of force no induced currents appear; but when it moves *across* the lines of force such currents are generated.

230. He proved, for example, that when a metal disc is caused to rotate so as to be tangent to the lines of force, no current appears; while when the disc, in its rotation, *cuts* the lines of force, currents flow along the disc, from the centre to the circumference and from the circumference to the centre. Closed circuits are thus established in the disc.

231. This, in fact, is the "Magnetism of Rotation," discovered by Arago in 1820, which received complete explanation at the hands of Faraday.

232. Faraday showed that the lines of force of terrestrial magnetism suffice to produce induced currents when they are intersected by the rotating disc. In fact, all the effects of magneto-electric induction may be obtained from the magnetism of the earth.

233. When a conductor rotates round an axis which is parallel to the lines of force, it experiences simply the resistance due to the friction of the air; but if the axis of rotation be transverse to the lines of force, the rotation is retarded by the interaction of the magnet and the induced currents.

234. This retardation may become so powerful as instantly to arrest the rotation. If, for example, a cube or sphere of copper suspended from a twisted string be caused to spin, by untwisting, between the poles of an unexcited electro-magnet, it experiences the retardation due to air friction only; but, on the supervention of the magnetic force, the rotation is suddenly arrested. Faraday also showed that in passing a plate of copper rapidly to and fro between the magnetic poles you seem to be cutting cheese, though nothing is visible. It is as if pure space were a kind of solid.

235. If by mechanical means the conductor be compelled to rotate or to move to and fro between the excited poles, it will be heated. Joule first demonstrated this; but a very striking demonstration of it was given by Foucault, who heated his celebrated gyroscope in this way. The heat is readily rendered sufficiently intense to melt fusible metal. Between the unexcited poles no effect of this kind is produced.

236. The repulsion set up by induced currents between the helices and the moving masses of iron in an electro-magnetic engine, would of itself limit the practical application of electricity as a motive power. Nevertheless, though such engines speedily reach the limit of their action, the conversion of molecular force into mechanical effect may be rendered far more perfect than in the case of the steam-engine.

The Extra Current.

237. If the secondary coil of a Ruhmkorff's machine have its ends united, the secondary circuit being then complete, the spark obtained in breaking the primary is small. On separating the two ends of the secondary the primary spark is instantly augmented.

238. The diminution of the spark is due to the reaction of the completed secondary circuit upon the primary. When the secondary circuit is interrupted, this reaction ceases.

239. The primary circuit in its turn can, when complete, react upon the secondary. It *is* complete whenever contact is *made* by the automatic contact-breaker. A great enfeeblement of the secondary current is the consequence. When the primary circuit is interrupted, the reaction does not exist; there is no enfeeblement, the full power of the secondary being developed. It is on this account that in Ruhmkorff's coil we obtain discharges *in a single direction* only, instead of discharges alternating in direction.

240. The reaction here referred to connects itself with what is called the *extra current.*

241. When a current is sent through a single primary coil the primary current excites in the wire which carries it a secondary current, opposed in direction to the primary. The primary arouses an antagonist in its own path, which, however, immediately disappears.

242. When the primary circuit is broken, a secondary current of momentary duration and having the same direction as the vanishing primary, is evoked in the coil.

243. Each of the two currents evoked *in the primary circuit itself,* at the commencement and at the cessation of the primary current, has been called by Faraday an *extra current.*

244. The spark obtained on breaking the primary circuit is augmented in brilliancy and power by the extra current.

245. If a second circuit be associated with the primary; if, for example, two covered wires are wound round the same reel; on making one of them a primary circuit, we have the brilliant spark due to the extra current, *as long as the ends of the second coil remain unconnected.*

246. But the moment they are connected the extra current in the primary circuit disappears; there is an instant reduction in the brilliancy of the spark.

Electric Polarization; Ritter's Secondary Pile.

1. When an electric current is sent through acidulated water a film of oxygen covers the positive electrode, and a film of hydrogen covers the negative electrode. One of these two substances being electro-positive and the other electro-negative they act in the liquid like two different metals, the hydrogen plays the part of zinc, and the oxygen plays the part of platinum.

2. Interrupting the primary battery circuit, and uniting together the two plates, covered with their respective films, an electric current is obtained.

3. The direction of this current is from the hydrogen film to the oxygen film in the liquid, and from the oxygen film to the hydrogen film through the connecting wire.

4. Two electrodes thus covered with condensed gaseous films are said to be *polarized,* and the currents obtained from them are called currents of polarization.

5. Now the battery current being always from oxygen to hydrogen (see Note 211), it is plain that the current of polarization is always opposite in direction to the battery current employed to polarize the electrodes.

6. When a decomposition cell with platinum plates is introduced into a voltaic circuit it is found that the battery current, though strong at starting. gradually sinks. This sinking is due to the gradual development of the antagonistic current of polarization.

7. Also, in the cells of the battery itself, this current of polarization may come prejudicially into play. When two metals, say zinc and platinum, and one liquid, say acidulated water, are employed, the platinum plate is coated with a film of hydrogen.

8. This hydrogen, being electro-positive, resembles a plate of zinc, so that when it is present we have, as it were, zinc opposed to zinc in the battery.

9. Were both plates actually of zinc we could have no current; and with the hydrogen film, which approximates to zinc, we have only a feeble current. To get the full effect of the zinc and platinum some means must be devised to remove from the platinum its film of hydrogen.

10. This is effected in Grove's battery by the employment of *two liquids.* The one is strong nitric acid, which contains the plate of platinum, the other is dilute sulphuric acid, which contains the plate of zinc. The nitric acid is placed in a vessel of porous earthenware, which becomes saturated with the liquid and allows the current to pass through it.

11. When the current passes, the hydrogen liberated at the platinum electrode in Grove's cell is instantly oxidized by the nitric acid and prevented from forming a film upon the surface of the platinum.

12. If instead of employing a single decomposition

cell and a single pair of platinum electrodes we employ a series of such cells, and send the same current through them all, we convert every pair of such plates into an active voltaic couple, and if the number of such couples be great effects of great intensity may be obtained.

13. If instead of using decomposition cells we simply employ a series of plates of the same metal, say a series of half crowns, separated from each other by pieces of bibulous paper, or by bits of cloth wetted with acidulated water, on sending a voltaic current through such a pile of plates we liberate on one of the surfaces of each plate a film of oxygen, and on the other surface a film of hydrogen. These play the part of the two different metals in the pile of Volta.

14. The electro-motive force of such a pile may be far greater than that of the battery which charges it. It may produce a far more brilliant spark, and urge its current against resistances which would be quite insuperable to the original battery current.

15. The discoverer of this form of pile was Ritter; it is sometimes called *the secondary pile*, to distinguish it from the battery which charges it.

THE WAR AND THE TELEGRAPH.

"Girdle the world with wires and men will be brothers" is a pretty thing to say. It has been comfortable to believe. We have joined in it. It is difficult to give it up now, but the argument of the times is against us. War goes on in spite of wires; nay, uses them to make its work sharper, and to gather its columns on the double quick to the conflict. So long as the causes of war are found in regions above the personal interests of society, and spring from danger to dynasties and systems, the telegraph has no mission of good save in one direction. It can inform and alarm the world; it can gather from civilization everywhere the protests of mankind, and war must thus be prosecuted in the face of and under the judgment of the whole race. In the expression of this judgment, and in the presence of those who utter it, the telegraph sways a more than imperial power; it becomes the voice of the congress of nations. As we write there is a moral protest going to Berlin and Paris from all nations against further carnage. Without the telegraph this could never have been done. Thus the recoil of the world against blood stops the uplifted sword, and the form of peace appears. She may not at once reign, but it is something for all good men to glory in that the dogs of war may thus be checked and confronted.

Yet it is easy to see that it is civilization which makes the wires a power of good instead of evil. Of themselves they are inert and meaningless.

"The light outspeeding telegraph
Bears nothing on its beam."

Every day it is used to convey the cyphers of villains, as well as the messages of pure hearts and honorable commerce. Peace must come to this troubled earth by other appliances than the means of killing time or conquering space. Society must be organized on the basis of human rights. Men must hate deceit, and resent a lie even when its pretext is mercy. Truth is the operator which will one day seize the wires and make the world feel that in the royalty of her sway the Sabbath of the world has come.

◆

Hitherto, electrical apparatus has been expensive; but by bringing his perfect practical knowledge to bear upon the subject, Mr. Stanley of Great Turnstile, Holborn, London, G. B., has produced an electric disk with Leyden jars, etc., by which a hundred experiments can be easily shown at the cost of a few shillings.

LIGHTNING RODS.

The Boston *Journal of Chemistry* says: "There is much doubt felt and expressed by owners of buildings respecting the full measure of protection alleged to be secured by the use of 'lightning-rods.' It is asserted by many that the hazard is increased by the employment of rods, and that more buildings are injured with than without them. Of course these opinions and prejudices are entertained by those who do not claim to have any special knowledge of electrical science, but are influenced by what they hear and read. The confusion and doubt which prevail are largely due to the absurd statements and claims of a class of men known as 'lightning-rod pedlars,' who at the commencement of every warm season, start out from our cities with wagons filled with rods of iron, copper, steel, &c., and bushels of glass 'insulators,' 'gold-tipped points,' and all kinds of strange and whimsical devices to excite the wonder and secure the confidence of the people in the rural districts. These men are drilled by their employers, the owners of new patents, to talk glibly about 'electrical fluids,' 'discharges,' 'insulation,' &c., and to depreciate every device but their own. Many house-owners have been so influenced by these charlatans as to be led to remove from their buildings rods to the extent of a half dozen different kinds in the course of as many years. The expense, annoyance, and doubt thus created are detrimental to the interests of property holders and to the cause of correct science. The careful decisions of science at the present time respecting lightning-rods may be presented as follows:

"*First.*—Rods correctly constructed and applied to buildings afford nearly, if not quite, perfect protection.

"*Second.*—The kind of rod most efficient is essentially like the one which was suggested by Dr. Franklin nearly a hundred years ago, and which is now often seen upon old buildings. It is made of iron, from three-quarters of an inch to an inch in diameter, and is continuous, without joints, 'insulator' attachments, or a multiplicity of 'points.' This rod can be made by any blacksmith, and put up without assistance from pedlars or lightning-rod patentees. It may be fastened to the building by iron eyes, painted black to preserve from rust, and have a sharp platinum point for a termination above the chimney, or gable. One is enough for an ordinary sized house; for large buildings, like barns and stores, two may be used.

"*Third.*—The earth connection of the rod is a *very important* matter. If there are gas or water pipes near the building, have the rod securely fastened to a band of copper, and let this pass around the iron pipe. If there are no pipes at hand, have the rod terminate in a well, or if that is not accessible, dig a deep hole in the earth, so as to reach permanent moisture, pour in a bushel of charcoal, and carefully bury the end of the rod in this. Three or four copper points may be affixed to the end, radiating horizontally. This form of conductor accords with the principles of electrical science as at present understood."

◆

The *Journal des Telegraphes* gives the following extract from the work of Mr. Villefranche, director of telegraphic transmission at Versailles, who gives the following interesting adventure among the Balkan Mountains:

"It was in the month of March, 1857, I was travelling from Varna to Bucharest through Bootschook only accompanied by an *arabadji*, or Bulgarian coachman, and by a *cavas*, or Turkish gendarme, who had been given to me as an escort. The railroad which to-day enlivens this wilderness was not constructed, not even planned, but the telegraphic line established by the French Government for communication with the army operating in the East had been in full operation already three years. We were traveling very slowly, halting to take our meals, to smoke, to sleep, or viewing a landscape, halting at all the *caravanseragli*, at all the villages, and at almost all the fountains which the Turks take care of with such a zealous attention; when, on a beautiful evening, we were not a little amazed to see ourselves surrounded by half a score of *Bachi boozooks*, whose cangiars and blunderbusses of all sizes, forming an angular, portable arsenal under their belts, were not in the least calculated to inspire confidence, and whose swarthy faces, grinning above the blunderbusses, created anything but enmity. We must add for the instruction of those who have not read of it, or who have forgotten the accounts and correspondence published by the newspapers of that time, that the boozooks were Ottoman soldiers, and enjoying a very bad name. They had stolen a great many things, but not certainly their fame. I began with distributing my provisions to them and many hand-shakings into the bargain, but they were soon exhausted, and as for the latter, the bystanders did not seem to care much about them.

"My oratory powers could not be a great help to me on account of the very little stock of Turkish words which I knew, and already did the Bulgarian seem disposed to dodge away were it only to save the carriage and trunks, in which he would not have succeeded. The threatening coil was closing up more and more; as for the cavas, after having cleaned, loaded, and prepared his long pipe, he was about firing, but only for lighting his tobacco. The two telegraph wires crossed exactly over the road. I jumped over one of the wheels, grasped one of the wires, and now striking it with my hand, now applying my ear to it, I pretended to listen, answer, and listen again, and then descending from my place and assuming an appearance of as great satisfaction as possible, I declared that I had just spoken with Vassif Pacha, the military commander of Chonmala, stating that Vassif is aware of what was being done, that he was even informed of the name of the Bachi boozooks' chief, and that, in short, there is no trying to struggle against the telegraph. The chief during this time had called the attention of his followers to the sonorous oscillations of the wires, and to the no less significant vibration of the post. The cavas confirmed the whole by very innocently insisting on the fact that the French effendi traveled through the wires.

"'Telegraph! telegraph!' repeated the gang, with an air of genuine stupefaction, mixed with a little terror, and quickly they disappeared. We did the same, lest they should change their minds. Our phlegmatical cavas had not even time enough to finish his tchibook."

◆

The Cable of 1866, which was broken at 4½ miles, and 75 miles from Heart's Content has been repaired. The route of the cable has been somewhat changed to increase its safety.

◆

An Earthquake has damaged and rendered useless the Black Sea cable. Messages are sent via the Russia overland lines.

◆

The telegraph lines connecting England with the islands of Jersey and Guernsey have been purchased by government.

◆

The laying of the West India and Panama cables under Sir Charles Bright is progressing successfully. We hope soon to announce the completion of a work of so much interest and importance.

PLEASE READ.

To the Editor of the Journal of the Telegraph.

DEAR SIR: Some three or four months ago I noticed a paragraph in the JOURNAL relating to the sending of office messages for answers, suggesting that offices sending requests for answers should send the address in full of the party to whom the message was sent. That was a suggestion of very great practical importance—none more so—and, if carried out, would save a world of time, trouble, and vexation to all parties concerned.

In large cities, where we have a great number of offices for the delivery of messages, it sometimes takes more time to find out what office a particular message has been delivered from, in order to obtain the address, than it would to send a message half a dozen times after the answer, provided the full address was given in the office message asking for answer.

Especially is this the case with messages between Boston, New York, Philadelphia, and Washington, where the printing instrument is employed, and skeleton copies merely are retained. Please again impress upon all the value of the request alluded to. I am positive it will be of great benefit to the public and ourselves.

H. B.

◆

OIL CITY, Penn., Sept. 18, 1870.

To the Editor of the Journal of the Telegraph.

Perhaps it is generally known, but I have seen many who do not know, that a Grove battery may be renewed without adding to or changing the nitric acid or the outside solution. The strength of the current may, in many cases, be increased three times by simply raising the zinc out of the liquid, allowing the globules of gas to escape, which globules will almost completely insulate the zinc from its surrounding liquid, if not disturbed. Replace the zincs, and the current will be found to have increased more or less, according to the conditions of the component parts of the battery as to freshness and cleanliness.

F. A. S.

◆

SELF-ADJUSTING RELAY.

INDIANAPOLIS, Sept. 11, 1870.

To the Editor of the Journal of the Telegraph:

DEAR SIR: I saw an account in your paper some time ago of a self-adjustable relay. I have accomplished the same thing with a common W. U. relay and pony sounder, with back stake screw and adjusting string detached. It has 104 ohm's resistance and I have it working on R. R. wire and can hear all (32) offices distinctly without any adjustment. This may be no new thing, but it is to me, and all I have spoken to about and showed it to. Do you think this could be accomplished with any relay, and is it desirable?

Yours, GEO. CUMMING.

The question of our good correspondent seems answered by his own statement that he has accomplished the work referred to. We would be glad to record exactly how he has accomplished it. The same result has been attained by different processes, which, nevertheless, have something in common in all of them. One of the most successful is Durant's, of which Mr. Cumming will find a notice in our number for December 15, 1868.

As to the value of self-adjusting relays there can be no question, although we prefer to see the lines placed in such condition, and the various resistances so arranged, as not to require them except subordinately. With a clean, well insulated, and well jointed wire, relays of small resistance, and a battery corresponding to the demands of the conductor, self-adjusting magnets become, of course, less valuable, if not unnecessary. Their value now depends on the utter simplicity of the devices employed and the ability to use them without the restraints of a patent, unless the advantage is very apparent.

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ENGLISH TELEGRAPH SCHOOLS.

We copy the following from the *London Electric Telegraph and Railway Review*, an admirable and most useful English weekly, published by T. Evans Lundy, and to which we are often indebted for excellent articles and needed information:

The Electric Telegraph Schools of Instruction, 164 an 166 *City Road, London, E.C.*

The extraordinary rapidity with which the science and art of Telegraphy has been diffused throughout the civilized world, and its daily increasing applicability for government, commercial, and other purposes, induced the proprietors in 1868 to open the above schools.

Ladies and gentlemen (in separate offices) can there acquire a thorough knowledge of the practical working of the Telegraph System *in all its departments*, whereby they will become eligible for appointments in the United Kingdom and abroad, and may obtain salaries varying from £40 to £300 in the United Kingdom; and from £180 to £500 per annum at stations on the Mediterranean, in Egypt, Persia, India, North and South America, and the Colonies. Owing to the enormous expansion of the system, resulting from the formation of many new Submarine Companies, the supply of operators is altogether inadequate to the demand.

Since the opening of the schools upwards of 400 pupils have been instructed in the principles and practice of Telegraphy, and have obtained appointments in this country and abroad.

The proprietors have spared no expense in the selection of the necessary scientific instruments, and have engaged electricians of great experience as instructors.

For those who have in prospect superior appointments, special arrangements are made for instruction in the higher branches of the subjects. The systems taught are those of Cooke & Wheatstone's needle, Bright's Bells, and Professor Morse's Printing, and Sir W. Thomson's Reflecting Mirror, as used by the Submarine Companies.

Ladies are under the immediate supervision of a lady superintendent.

Terms (payable in advance): Ladies, three guineas; gentlemen—home service, five guineas; foreign service, ten guineas. Three hours' daily instruction will be given for two months, in which time a person of ordinary capacity should be able to qualify for an appointment at home or abroad. The fee for pupils requiring *private tuition* in the ordinary and higher branches is fifteen guineas.

Full information may be obtained on application to

T. EVANS LUNDY, Secretary.

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THE telegraph line running from Napa City to Calistoga, which was owned by the California Pacific Railroad Company, and leased of them by F. M. Crawford, of Napa, and E. B. Badlam, of Calistoga, has been sold to the Western Union Telegraph Company. The above parties are retained as operators on the line and an office opened at St. Helena, a small town between Calistoga and Napa. Mr. W. S. Carman has been appointed operator for that office. Possession was taken on the first of this month, and the parties are making considerable repairs on the line.

AMERICAN WIRE GAUGE.

TABLE OF THE SIZE, WEIGHT, LENGTH AND STRENGTH OF IRON WIRE.

Wire Gauge.	Diameter.	Weight of 100 Yards.	Weight of 1 mile.	Length of 1 Bundle.	Length of 1 Cwt.	DIRECT STRAIN Area of Section	DIRECT STRAIN B'rking Weight	Wire Gauge.
NO.	INCHES.	LBS.	LBS.	YDS.	YDS.	SQ. INCH	LBS.	NO.
5-0	0.456	161.00	2830	39	70	0.163	13070	5-0
4-0	0.425	140.00	2460	45	80	0.142	11350	4-0
3-0	0.394	120.00	2113	52	93	0.122	9756	3-0
2-0	0.363	102.00	1719	62	110	0.103	8290	2-0
0	0.331	84.72	1490	74	132	0.086	6890	0
1	0.300	68.75	1210	91	162	0.071	5650	1
2	0.280	59.90	1054	105	187	0.062	4930	2
3	0.260	51.65	909	121	216	0.053	4250	3
4	0.240	44.00	775	143	255	0.045	3691	4
5	0.220	37.00	651	170	303	0.038	3040	5
6	0.200	30.56	538	206	366	0.031	2510	6
7	0.185	26.15	461	239	428	0.0265	2220	7
8	0.170	22.10	389	286	509	0.023	1840	8
9	0.155	18.36	323	342	610	0.0186	1560	9
10	0.140	14.97	264	420	747	0.016	1260	10
11	0.125	11.95	211	529	940	0.0123	1000	11
12	0.110	9.24	163	700	1212	0.010	800	12
13	0.095	7.05	124	893	1589	0.0071	568	13
14	0.085	5.51	97	1143	2031	0.0057	456	14
15	0.075	4.29	76	1468	2608	0.0044	352	15
16	0.065	3.22	57	1956	3478	0.0033	264	16
17	0.057	2.48	44	2540	4515	0.0026	206	17
18	0.050	1.91	34	3150	5860	0.0020	160	18
19	0.045	1.55	27	4065	7226	0.0016	128	19
20	0.040	1.22	21	4913	9180	0.0013	104	20
21	0.035	0.94	17	6416	11951	0.0010	80	21
22	0.030	0.69	12	8736	16300	0.0007	56	22

SIZES WIRE EXPRESSED IN FRACTIONS OF AN INCH

No.	000000,		"WASHBURN'S GAUGE,"		equal to	15-32	inch.
"	00000,	full,	"	"	"	7-16	"
"	0000,	"	"	"	"	13-32	"
"	000,	"	"	"	"	3-8	"
"	00,	"	"	"	"	11-32	"
"	0,	"	"	"	"	5-16	"
"	1,	"	"	"	"	9-32	"
"	3,	"	"	"	"	1-4	"
"	4 1-2	"	"	"	"	7-32	"
"	6,	"	"	"	"	3-16	"
"	8,	"	"	"	"	5-32	"
"	11,	"	"	"	"	1-8	"

◆

ELECTRIC SHIP-LIGHTS.—Electric light apparatus, which for some three or four years has been the subject of successful experiment in the French navy, has now been introduced on board the French transatlantic packets, and been found extremely useful on dark nights and foggy weather. A similar apparatus has been placed on board the iron-plated frigate *Heroine*, and the whole of the fleet will before long be fitted with them. The maker of them has also received a similar order for these lights from the Russian Government. The apparatus, which is placed at the head of the vessel, consists of an electric light with a powerful reflector. The light is produced by an electro-magnetic machine, set in motion by a donkey-engine. The reflector is on the Fresnel system, like those employed in lighthouses. Its use is to illuminate the horizon in foggy weather, or any point of the coast on which it is intended to make a descent at night. The light is sufficiently powerful to bring out any point of the coast with perfect clearness at a distance of two miles, while, at the same time, the ship would be entirely invisible from the shore, unless, indeed, it was made perceptible with the aid of some well-arranged reflecting surface or medium.

◆

THE THEORY that light, heat, electricity and all the natural forces are but different modes of motion, is carried out still further by Professor W. A. Norton, who, in a recent number of *Silliman's Journal*, makes gravitation the prime motion in which all other motions and forces have their origin.

◆

IN placing Cherbourg in a state of defence, its mole has been armed with guns of long range; the entrances east and west are closed by *torpilles* charged with picrate of potass, and united with one another by electric wire, so that they can be set fire to at the proper time.

Evansville, Ind., Sept. 7, 1870.

J. D. Reid, *Esq.*

Dear Sir: When I saw Mr. Orton's challenge in last Journal, I thought of my old friend Jimmie Leonard. Why is it that Phillips of R. I. gets credit in the trial of speed as being the fastest receiver, when he received 2,731 words, and Leonard 3,300 in one hour? Please answer in Journal of Telegraph, and oblige one of your old boys,

Booth.

We answer our old boy Booth, who is now an active and skillful and excellent superintendent of the Ohio River Telegraph Company, that we would have been only too glad to have recorded Leonard's name as performing such a work, had we known or remembered it. No more skillful fingers ever touched a key. He and Durfee of Cincinnati, now both dead, were kings in the business. Their very names have a precious odor with them, so pure and gentle were their natures. We believe Leonard was dead when the test was made to which Mr. Booth alludes. We would be glad to know under what circumstances Leonard's feat was accomplished.

We were once witness to a feat we have never seen equalled—Durfee of Cincinnati was the operator. He was alone, and as we entered the room was sending a message to Louisville. While doing so Pittsburgh called him. Releasing his fingers for an instant from the Louisville key, he responded to Pittsburgh, and told him to go ahead. Thereupon Pittsburgh sent one or two messages. They were completed by the time Durfee was through with Louisville, when taking his message paper clip he copied off the two messages which he had received by sound while sending to Louisville. We did not feel easy, it may well be conceived, under such a process, great as our confidence was in the man. This Durfee saw, and had Pittsburgh repeat the messages which we found had been translated correctly. We have often wondered at the power shown to divide the mind's action in this curious way, yet never have desired to see it attempted. It is an exceptional gift, and few can accomplish such a result with safety.

◆

Lighting Gas by Electricity.—D. Miles, Boston, Mass.—This consists in operating only one apparatus at a time, two separate wires being employed (one to turn on and the other to shut off the gas), in connection with an automatic circuit-breaker in each apparatus. The current of electricity passes through one wire to the electro-magnet of the first apparatus in the circuit (returning through the ground), and as soon as the gas valve of this apparatus has been opened or closed the motion of the mechanism connected therewith is arrested by the breaking of the circuit, the current being by the same movement of the automatic circuit-breaker connected with a wire leading to the next apparatus, when the operation is repeated, and so on throughout the whole series of lamps. Thus it will be seen that one apparatus only is included in the circuit at a time, the breaking of the circuit in each apparatus serving to connect the electro-magnet with the other wire, by the current of which the mechanism may be again set in motion, the two wires being used alternately one to turn on the other to shut off the gas.

◆

Javan Telegraphy.—It is said that the Dutch colonial minister at the Hague has actually granted since November, 1869, four concessions of telegraphic lines to Java. The three first concessions have, however, been withdrawn in favor of a final concession granted to the British-Australian Telegraph Company.

GRADES OF INSURANCE.

Boston, Sept. 14, 1870.

J. D. Reid, *Esq.*

Dear Sir: A plan for Coöperative Life Insurance, which might be adopted by the present Telegraphers' Association, has occurred to my mind, and upon which I would like your views.

There are undoubtedly many telegraphers who would take membership in this Association in preference to taking an ordinary life insurance policy, if they could purchase a larger amount of insurance than is possible under present limit.

There are undoubtedly others who are not members of the Association, but who would become such if they could insure at smaller cost and for proportionally smaller amounts, the choice depending upon amount of salary received and other circumstances of the individual.

The plan referred to is to give membership in two, three or more classes, the assessments of each class to be made separately and independently, the amount of assessment to be the same in each class, viz: one dollar. Thus, one person may have membership in class A only, and in case of death the members of that class only are assessed. Should he be a member of classes B, C and D also, then the members of those classes are also assessed. It follows that an individual may become members of whichever class or classes he or she chooses, thereby receiving the benefit of high or low insurance at a corresponding cost, according to the means or disposition of the individual, the operation of the plan being equitable; and it would seem that by offering larger insurance to present members and a choice of classes, or combination of classes to non members, the result might be a considerable increase of business, and greater benefit to families of members in case of death. Yours, very respectfully,

T.

◆

Of the important intelligence which we publish to-day, in reference to the European war—the leading features of which we issued exclusively in the form of a bulletin on the 31st ultimo—nearly two columns was received by telegraph from Colon, dispatched immediately on the arrival of the *Henry Chauncey*, with rapidity and accuracy not to be surpassed anywhere. On behalf of the public, and for ourselves, we acknowledge the important service rendered by the Railroad Company in the use of their wires, and equally do we feel indebted to Mr. Thomas of Colon, and Mr. Burnett of this city, for the alacrity displayed by them on this, as on all occasions, in carrying out, for the benefit of the public and ourselves, the liberal arrangements of the Company of which they are such valuable employés.—*Panama Mail.*

◆

Electrophotomicrography means the art of photographing objects as magnified by the microscope, by the help of electrical light, but we wish it could be called by some other and briefer name.

◆

The Singapore and Batavia Cable.—Mr. Alexander Fraser, of Batavia, writes to the Hon. Alexander Campbell, member of the Legislative Council of New South Wales: "Captain Osborn assures me in a letter I have from him by last mail, that they will begin to lay the Singapore and Batavia cable in the autumn, and he hopes, he adds, to be able to send me his salaams by the entire submarine route from Falmouth to Batavia in November."

◆

The Morse Testimonial Fund now exceeds $5,000.

◆

S. S. Bogart, a man who "never strikes," became the father of a boy, Sept. 29th.

PROGRESS OF RAILROADS.

We believe we are within bounds when we say that there are under contract for immediate construction within the United States, fifteen thousand miles of railroad. One-third of these will be completed within the present year, and five thousand of the total fifteen thousand are enterprises to be completed without national aid. The cost of all these roads will approximate one-third of the amount of the national debt.

Of course this all means a similar extension of the telegraph. The wire is needed among the first elements of construction. It is a most disturbing fact to some, yet illustrative of the vast value of the telegraph to locomotion, and which must be accepted as a commanding necessity. When will this developing process cease? Many ask the question anxiously. The cost of meeting it has to enter into all calculations of present policy and future revenue. We cannot answer. Every year swells the thickening population of our vast domain, and leads commerce on our new paths. No enlightened man would check this if he could. It may go on for a century yet to come. We only know that we must open the door, or others will burst it in.

◆

Inauguration of the Kepler Monument.—On the 24th of last June, the very small Swabian town named Weildiestadt, with hardly 2,000 inhabitants, was the scene of a festive gathering for the purpose of unveiling the statue of the celebrated Kepler, who was born in an humble cottage yet existing, and now known as Keplerhaus. The statue of the celebrated astronomer, executed in bronze, represents him seated on an arm-chair; in his left hand, supported by a celestial globe, he holds a scroll, upon which an ellipse is delineated; in his right hand he holds a pair of open compasses. At the four corners of the pedestal, upon which the statue is placed, are smaller statues, representing Michael Mastin, the Tubingen professor who taught Kepler mathematics, and Nicholas Copernicus, Tycho-Brahe and Jobst Byrg, who assisted Kepler in making astronomical instruments. On the centre of the pedestal is simply placed "Kepler"; the other sides of this portion of the monument are embellished with bas-relief representations of incidents of Kepler's life.

◆

A Nova Scotia vessel was recently fined £1,400 by an English Court for cutting a telegraph cable. The vessel anchored off Dover, and while getting the anchor on board it became locked with the cable, and in order to get free from the encumbrance, the captain gave orders to cut it.

◆

BORN.

Cooper—Sept. 17, at Bay City, Mich., to Thomas J. Cooper, a daughter.

◆

MARRIED.

Casey—Phillips—At Chester, Pa., Sept. 21, by the Rev. Henry Brown, Edward W. Casey, manager W. U. Tel. office, Linwood, Pa., to Miss Mollie L., daughter of J. Phillips, Esq., of Marcus Hook.

Dwelle—Gray—At the residence of the bride's father, September 15, by the Rev. W. L. Kilpatrick, Geo. W. Dwelle, manager W. U. Tel. Office, Millen, Ga., to Miss Janie L. Gray, of Millen, Ga.

Reid—Smith—September 15, at Omaha, Nebraska, by Rev. Dr. W. W. Everts, of Chicago, William I. Reid, of New York, to Miss Mary N. Smith, of the former city.

Shuckhart—Gardner—On Wednesday, Sept. 7, 1870, at the residence of Mr. S. L. Gardner, Granville, Ohio, J. H. Shuckhart (manager Oakdale, Pa.) and Miss Hetty Gardner. No cards.

Stoy—Vonderlieth—In Athens, Ga., Sept. 13, at Emanuel Church, by Rev. Dr. Henderson, Harry R. Stoy, operator Kingston, Ga., to Miss Florina W. Vonderlieth, Athens, Ga.

◆

DIED.

Fisher—At Baltimore, Md., Thursday, Sept. 22, of consumption, Isaac Fisher, Jr., aged 23 years.

For fifteen years in the Western Union Company's employ as messenger, office boy and clerk, always faithful, attentive and reliable.

Wilson—At Winchester, Ill., after a short illness, Alice, sister of W. D. Wilson, operator, Frederick, Ill.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 3,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, SEPTEMBER 15, 1870.

PRACTICAL SUGGESTIONS.

The usefulness of a Journal such as that over whose columns we modestly preside, is to be found not so much in the aliment presented by its editor, as in the fruit sent in by those who themselves expect to be the guests of his table and are able to add to its attractiveness. It is a good thing to have a cheerful and generous host, and such we endeavor to be; but our very virtues may become tame and offensive if our voice is suffered to be the only one to be heard at the table, and our taste the only one which supplies and arranges the cuisine. This JOURNAL, to be effective, should be of the family type, in which there be many cheerful and communicative voices; or of the nature of a conversazione in which all seek, with courtesy and mutual respect, to add to the general knowledge, or discuss with kindness and sparkle the merit of current invention or of passing events. Our place should be largely paternal, inspiring all to ease and hilarity, and checking, as unoffendingly as we may, all tendencies to the abuse of a hospitality which is given for pleasure and advancement, not for the indulgence of enmities, or the monopoly of the noisy and the empty. Of course, we shall claim the right to our own part of the talk, however sparingly it may be used, and to ring the bell when others talk too long; but we will always be happier to present a new guest with his budget of good things than to exercise even the right which may be our own.

In our last number we printed two letters which we would be glad to know were the avant couriers of many more. One was inspired by the recent articles of Mr. Prescott on the maintenance of batteries, which have commanded a wide and deserved attention. The other was a suggestion which has to do with a practical difficulty which almost daily stares operators, everywhere, in the face, and which an intelligent manager of an office down in the wilds of New Mexico desires to relieve. These letters do good. They lead to experiment. They tend to more special executive interest on the part of those in authority, for the best lessons in art, as in war, are found in the experience of the ranks. No hand knows better how to shape the shaft of the oar than he whose hand hardens in its use, and a wise captain will give it the form which the sailor finds most effective.

What does all this mean? Only this. We desire correspondence of a practical character. All are welcome to use the JOURNAL who will talk sensibly and cheerfully. We do not want any growling or stabbing, although a fair fight on a good subject will be allowed. Let us hear from you all. Write with brevity and clearness. Let your manuscript be clean. Good morning.

◆

FROM experiments recently made it would appear that when a main battery first shows loss of vigor the elements are not consumed, but simply require rest. Sometimes a disturbance of the liquids tends to regain their original action. The letter we publish from Oil City in the present number suggests this same fact. At the New York Exhibition we have seen a device giving more decided proof, to which we draw attention. It is exhibited by E. D. McCracken, Esq., who politely explained to us its operation, although sufficiently simple to be seen without help.

Two electropoion batteries of six elements each are put in connection with a magnet and galvanometer for alternate use, the circuit of each not exceeding ten feet, the resistance of the magnet and conductor being about seventy ohms, or say five miles. On such a circuit a battery of that size would usually exhaust itself in at most a few hours. The fluid used is, in the cell, "electropoion," and in the jar water and sulphuric acid, 60 to 1. Connected with the battery is a clock to which a wheel is attached so spaced with alternate non-conductors on the rim, that an arm resting lightly on it switches in these batteries by the aid of a magnet alternately every five minutes. One battery is, therefore, always at rest, and never in use over five minutes at a time.

The result is that after fourteen days' steady action, and on a closed circuit, without adding to either battery or disturbing their elements, their power had only decreased two-fortieths, and that only on the last day of the fourteen. At the end of 18 days the decrease of power was one-fifth, and the cost of material consumed 12½ cents. Now here is a valuable fact worthy of attention. It is easily proven. It is now under test on one of the Western Union Company's wires. It seems a valuable addition to our stock of knowledge and to the economics of electricity. We shall report its further development.

◆

MR. W. W. SMITH, Vice-President of the Cincinnati and Layfayette Railroad Company, is an old telegrapher, and loses nothing of his interest in the "machine" and art. On a recent visit to New York, which we much enjoyed, he mentioned a fact which is of sufficient importance to record.

It is the habit of operators, when two wires are crossed, or when they work together on account of escape of any kind, to open one wire and work the other. Mr. Smith finds it a much better plan to connect the two wires outside the key, and work the two wires as one. The size of the conductor is thus doubled, the action rendered steady, and escape reduced. This is one of those practical suggestions which are often productive of valuable results, which can easily be put to the test, and which all should know. By such means the whole system is benefitted, the *esprit du corps* strengthened, and by easy practical lessons the effectiveness of the lines and a higher plane of general intelligence secured.

◆

AN IMPORTANT and suggestive association has been formed in England called "The Society of Telegraph Engineers." Its work and object is mutual interchange of ideas among its members, so as to stimulate inquiry and more rapidly approach perfection in this last, and, in some respects, richest of the gifts of science to the world.

We would be glad if such an association were possible here. We have many acute and learned electric thinkers, but they are isolated from each other and, like stars, "dwell apart." One thing we certainly deem possible. In France there exists a council on "Telegraphic Invention or Improvement." At its sittings an inventor may come and secure a fair and exhaustive test of his invention, and an intelligent report thereon for publication. This seems easy of accomplishment here; and yet it is not. Usually a useful invention, to be productive to its inventor, is necessarily concealed until purchased, and the experts are the inventors. Even the purchaser has his motives for concealment. Thus inventors avoid each other, and purchasers secrete their acquisitions to secure the greater personal or associated success. Even this has its advantages. Yet we believe the time will soon come when a "Council of Electricians" will be possible even here. The American brain has certainly proven itself fruitful enough in this department. The American operator is, in general, the highest type of the craft in the world, our foreign engineers being judges. Whatever promises increased excellence they desire.

◆

THE Morse Testimonial Fund now exceeds $5,000. The residue needed is coming. In our next we will give some gratifying particulars. Does any one now doubt its success? If there is such, let him send a check of corresponding proportions.

◆

From the London Graphic.

THE telegraph service of the country is in a condition which, were it not for the seriousness of the case, might well be described as comical. In the old time I remember some curious blunders. But we surpass them now. A telegram takes exactly twenty-four hours to go to Dublin; and, when it gets there, it is unintelligible. The "Parable of the prodigal son" becomes the "parody of the probable sun," and a commercial traveler who is advised by his principals to go to "York" goes to "Cork" in accordance with his telegraphic instructions. The other day a gentleman in London was asked, by letter, to take opera boxes for one of us provincials and to telegraph if he had secured them. Duly the telegraph came, "I cannot get the boxes." Of course, we did not go to town. Yet the boxes had been bought and the message reversed en route. Our good friend who had paid five guineas for the boxes wrote to the Government Telegraphic Department, claiming compensation. In due time he received an official letter acknowledging the error, and stating that "Government had great pleasure in inclosing him twelve stamps, the cost of the message."

EXECUTIVE ORDER NO. 107.

EXECUTIVE OFFICE, WESTERN UNION TEL. CO.,
September 29, 1870.

Rule number six (6) not having been uniformly understood as intended, is hereby modified to read as follows:

RULE SIX (6).—Where messages contain amounts, dates or numbers, require the customer, *in every instance*, to write them plainly in words. If such amounts, dates or numbers, after being plainly written in words, be also duplicated in figures *by the customer*, such figures must be counted as part of the message and included in the check. Figures inserted by the customer must not be erased by receivers or operators; nor will they insert them except at the request of the customer, in which case they will be charged for and transmitted. When amounts are duplicated in figures charge for the figures the same as for the words which represent them.

WILLIAM ORTON, President.

◆

ALL the Atlantic cables are now in working order.

◆

D. HELT OGDEN, manager W. U. Tel. Co., at Cedar Rapids, Iowa, has become associate-editor of the Cedar Rapids *Morning Observer*. We give him our hand.

◆

THE CONGRESSIONAL INVESTIGATING COMMITTEE, referred to in our issue of July 15, which was to have met in New York, Sept. 20, to examine certain alleged irregularities, was not convened, it having been ascertained that the examination was unnecessary.

◆

MR. M. BULL having performed much valuable service in the Eastern Division, as electrician under General Eckert, will, on November 1, commence a similar service in the Southern Division under Mr. Van Horne. Few men have made themselves more useful, or performed their work with equal neatness, completeness and skill.

◆

A FLEET OF VESSELS left England about the middle of September, carrying about 2,000 miles of cable to extend the telegraphic connection of the East to Singapore and Batavia. These cables are made with great care, and the one now shipped showed 94 per cent of pure copper in the conductor, and the insulation was 50 per cent above the fixed standard. The construction of these cables has been under the inspection of Latimer Clark and H. C. Forde, with a staff of experts.

◆

IT IS proposed to lay a submarine cable between New Zealand and Australia.

◆

THE SCARCITY of skilled telegraphers in England is so great that they have to be advertised for by companies needing them.

◆

SPECIAL DELIVERY.

It is a matter of daily occurrence for persons to offer messages for parties resident at a distance from a telegraphic station requiring instant delivery. It is not always certain how much the delivery of such messages will cost when special means have to be taken to deliver them. Thus parties sending such messages are required to deposit a sum large enough to cover even an extraordinary demand for expressage, if the service must be secured. A request then accompanies the message for advice of the cost. *This is not answered with necessary readiness.* Parties are kept waiting in uncertainty, or they leave dissatisfied, or the manager finds himself liable for more than the deposit.

The object of this article is to urge in all such cases an *immediate* statement of the cost of special service the instant it is ascertained. If this is not done, large and arbitrary charges will have to be insisted on to protect managers from loss, and the public be needlessly annoyed.

THE following graceful letter was addressed to Mrs. Sadler by request of the Board of Directors of the International Ocean Telegraph Co:

OFFICE OF THE INTERNATIONAL OCEAN TEL. CO.,
No. 86 Liberty Street, NEW YORK, August 31.

MRS. W. W. SADLER.

DEAR MADAM: By resolution of the Directors of this Company, passed at the meeting held this day, I have been delegated to convey to you their feelings of respect for your husband, who has so suddenly been taken from among us while yet in the very prime of life. I approach the fulfillment of this duty with the fear that I shall be unable to place, in words, an eulogium commensurate with the feelings that animate our hearts.

Mr. Sadler has been for many years connected with the great telegraph lines of this country, and has won for himself a place in the hearts of his associates, as well as the meed of having been honest, faithful and capable, crowning these sterling qualities by his retiring modesty and the utmost kindness of heart. I have been intimately associated with him from the inception of the International Ocean Telegraph Company, which was organized in 1866, and, previously, for years in other telegraph enterprises. He possessed my fullest confidence and appreciation of his ability and faithful discharge of all the duties assigned to him. This Company feels that, in losing him, it has lost one of its most true and valued employés.

Mr. Sadler was a warm friend and a generous hearted gentleman. He endeared himself to all with whom he came in contact. It was with mingled feelings of sorrow and awe that we learned of his sudden demise. His powerful frame and robust health, with his regular mode of living and temperate habits, led us to consider that long years of life and usefulness would be accorded him; but God, in his infinite wisdom, has seen fit to decree otherwise, and we can only bow submissively to the divine decree, in the trust that our estimation of his merits will be verified in that great day when we must all be judged according to the deeds done in the flesh, and that it shall then be said unto him, "Well done, thou good and faithful servant; enter thou into the joy of thy Lord."

For you who are bereft of a near and dear one we offer our truest and most heartfelt sympathies. Our faith in the wisdom and love of our Creator assures us that he does not afflict us willingly. We are also assured that we can at all times approach Him with our cares and afflictions, and receive strength to bear whatever seeming ill He may place upon us. I can only commend you to that source for consolation in this hour of your deep affliction. Respectfully yours,

W. H. HEISS, General Superintendent.

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TELEGRAPHIC ENTERPRISE.

The Montreal Telegraph Company did a good night's work after the boat race at Lachine. The company, with its customary excellence of management, had a sufficient force of operators on hand at Lachine and Montreal to accommodate all comers, and although there was an immense amount of telegraphing it was done upon an admirable system and with wonderful speed. The Montreal papers tell us that during the night, and in ample time for the earliest editions of the press on the following morning, there were transmitted to the newspapers of Ontario 11,250 words; of New York and Boston, 11,374; of other places in the United States, 345; of St. John, N. B., 7,339; of Halifax, 675—making a total of 31,483 words. In addition to this a dispatch of 2,326 was sent by Atlantic cable to the Newcastle *Chronicle*, the first part of which was received at Newcastle at 12:20 a. m., or (allowing for difference of time) a trifle over an hour after its commencement at Lachine. The agent of that paper in Montreal has received a cable telegram to the effect that they received the last of the dispatch at 3 a. m., and it duly appeared in the *Daily Chronicle* of the morning of the 16th. The last word of the cable dispatch was handed in to the company at Heart's Content, Newfoundland, within three minutes of the time it was dispatched, and the whole was received in England within two hours of its dispatch from Lachine. This is extremely creditable to the company as well as to the *Chronicle*.

◆

TELEGRAPHIC COMMUNICATION WITH JAMAICA.—*Havana, Sept. 19.*—The Panama and West India cable was opened to the public to Jamaica this morning. The following tariff on messages has been agreed upon: From the United States to Cuba, $2 50; to Jamaica, $5 for a message of ten words; every additional word over ten, to Cuba, 25 cents; to Jamaica, 50 cents. The submerging of the cable will be continued to Aspinwall as soon as received.

MORSE TESTIMONIAL FUND.

RECEIVED SINCE LAST ISSUE.

NEW YORK CITY.

E. S. Sandford, New York	$100 00
D. N. Barney, New York	100 00
William E. Dodge, New York	100 00
Harrison Durkee, New York	100 00

CANADA'S GIFT.

We welcome with great pleasure the following:

MONTREAL TELEGRAPH COMPANY,
MONTREAL, 21st Sept., 1870.

JAMES D. REID, *Esq., New York.*

DEAR SIR: I beg to inclose you list of subscribers to the "Morse Testimonial," amounting to $289 21, of which $250 46 was received in gold and $38 75 in U. S. currency. The U. S. currency contributions are marked * in the list.

I trust that the enterprise will come to a successful result both financially and artistically, and, above all, that Professor Morse may feel as pleased and honored in receiving this mark of esteem and appreciation at the hands of the telegraph staff of America as they have felt in contributing to the "Morse Statue."

Your obedient servant,

CHARLES BOURNE.

GENERAL OFFICE, MONTREAL.

James Dakers, secretary	25 00
C. Bourne, treasurer	3 00
J. S. McConnell, bookkeeper	1 00
Wm. Scott, clerk	50
Rich'd Scott, clerk	50
D. Adams, clerk	25
J. Pousttie, supt. line building and repairs	1 00
A. Grant, inspector	1 00
W. Bowman, storekeeper	1 00

FROM THE MONTREAL TELEGRAPH COMPANY'S OFFICES.

Miss Scott, Almonte, Ontario	$1 00
H. Scott, Almonte, Ontario	25
S. A. Findlay, Ancaster, Ont	1 00
T. F. Chapin, Angus, Ont	1 00
W. C. Mitchell, Arnprior, Ont	1 00
J. Belfour, Bath, Ont	1 00
Miss Smith, Bathurst, N. B.	1 00
J. H. Marchildon, Batiscan, Que	1 00
Albert Martin, Beauharnois, Que	50
A. Blondin, Becancour, Que	1 00
G. S. Yearly, Bramley, Ont	$1 00
T. C. Lockwood, Brighton, Ont	1 00
Thos. May, Bristol, Que	1 00
R. K. Dunham, Bryant's Pond, Me	*1 00
R. L. Melles, Canfield, Ont	25
T. Savage, Canfield, Ont	13
A. J. Pattison, Canfield, Ont	13
A. E. R. Bellefeuille, Chambly, Que	1 00
James Cushing, Chatham, Que	2 00
Geo. Edwards, Clarence, Ont	1 00
Wm. Nichols Clarence, Ont	50
Miss A. Farnsworth, Clayberg, N. Y	*1 00
H. A. Wood, Clayburg, N. Y	*1 00
Charles Hall, operator, Clifton, Ont	1 00
G. Kennedy, repairer, Clifton, Ont	1 00
G. Plumister, messenger, Clifton, Ont	25
M. McDonald, Coaticooke, Que	1 00
W. R. McCutcheon, Coaticooke, Que	1 00
M. Duperow, Cobourg, Ont	1 00
Rob't Buck, Cobourg, G. T. R., Ont	1 00
A. Pentland, Collingwood, Ont	40
W. G. Hollister, Cornwall Ont	1 00
L. H. Stiles, Cornwall, Ont	50
H. A Johnson, Dalhousie, N. B	2 00
W. Elliott, Danville Que	25
J. N. Peel, Ecclesville, Ont	50
G. R. Douglas, Evans Mills, N. Y	*1 00
H. M. Stone, Falmouth, Me	*50
W. L. Hibbard, Farnham, Que	2 00
Eugene Dwyer Fort Erie, Ont	1 00
F. J Parker, Frelighsburg, Que	1 00
A. Malone, Garden Island, Ont	1 00
L. W Breck, Garden Island, Ont	1 00
W. Kirk, Gilford, Ont	50
A Armstrong, Goderich, Ont	1 00
W. McFarlane Goderich, Ont	25
T. Moore Weller, Harwood, Ont	1 00
J A Barber, Harwood, Ont	*1 00
W. M. Phillip, Harwood, Ont	*1 00
Mr. Le Roy, Havelock, Que	1 00
A. Grant, Havelock, Que	25
T. Eadie, Havelock, Que	25
Miss N. Walker, Hemmingford, Que	1 00
G. E. Chapman, Hespeler, Ont	50
S. S Cushman, Hull, Que	2 00
J. S. Buck, Hull, Que	1 00
T. Donohu, Hull, Que	1 00
Jas. Kearns, manager, Kingston, Ont	1 00
C. Hosmer, operator, Kingston, Ont	1 00
J. Foster, operator, Kingston, Ont	1 00
J. Heagens, bookkeeper, Kingston, Ont	1 00
H. Putnam, entry clerk, Kingston, Ont	50
J. W. Baker, Kingston G. T. R., Ont	*2 00
K. Dowsley, Kingston G. T. R., Ont	*1 00
J. Mozam, Kingston G. T. R., Ont	*1 00
J. H. Lefebre, Knowlton, Que	2 00
Miss A. Scott, Lachine, Que	1 00
W. J. Sherwood, Lachine Junc., Que	75
W. C. Furness, manager, London, Ont	2 00
W. A. Gunn, London, Ont	1 00
J. C. Showerman, Supt. Tel, G. W. R., London G. W. R. Ont	2 00
C. W. Bentington, Lynden, Ont	1 00
W. L. Hall, Malone, N. Y	*2 00
G. Dickinson, Manotick, Ont	1 00
J. Brown, Manvers, Ont	25

J. Swetzinger, Moulinette, Ont.	1 00
D. J. McGillis, Moulinette, Ont.	50
H. Chalmers, Morrisburg, Ont.	1 00
W. Perrin, Morrisburg, Ont.	25
T. F. O'Connell, Napanee, G. T. R., Ont.	1 00
R. McRossil, Napanee, G. T. R., Ont.	1 00
Thomas Fleming, Napanee, G. T. R., Ont.	50
Miss McNaughton, Newcastle, Ont.	25
W. Lawrence, New Haven, N. Y.	*1 00
J. Smith, New Lowell, Ont.	50
Miss M. Chilias, Nicolet, Que.	1 00
J. Twohey, Norton Pond, Vt.	*1 00
Jas. Gaudin, Pierreville, Que.	1 00
M. Cream, Point Levi, Que.	1 00
F. Pare, Point Levi, Que.	1 00
P. McCabe, Point Levi, Que.	25
Martin Eby, Port Elgin, Ont.	1 00
A. Hutchinson, Port Elgin, Ont.	1 00
S. Patterson, Port Hope, Ont.	1 00
E. E. McCormick, Port Hope, G. T. R., Ont.	1 00
T. Henderson, Port Hope, G. T. R., Ont.	50
L. J. Davis, Port Perry, Ont.	50
B. O. Franklin, Port Ryerse, Ont.	1 00
L. B. McFarlane, Prescott, Ont.	1 00
M. Addison, Renfrew, Ont.	$1 00
Miss Sutherland, Richibucto, N. B.	50
W. H. Chauncey, Richland, N. Y.	*1 00
M. Deschenes, Riv. du Loup en bas, Que.	1 00
W. E. Edwards, Rockland, Ont.	2 00
E. Powers, Rouse's Point, N. Y.	*1 00
J. Flanagan, Rouse's Point, N. Y.	*50
E. B. Dixon, Sackville, N. B.	1 00
G. McCord, Sackville, N. B.	1 00
J. McAdam, Sand Point, Ont.	1 00
J. Murphy, Scarboro, Ont.	41
W. McCollum, Shakespeare, Ont.	50
S. W. Henderson, Shediac, N. B.	2 00
E. A. Cannon, Shediac, N. B.	1 00
F. Jean, Somerset, Que.	1 00
S. Buttery, Sorel, Que.	2 00
C. T. Wales, St. Andrews, Que.	1 00
J. L. Davoust, St. Anne's Ch. de Lisle, Que.	*1 00
Miss Julia Motte, St. Anne's de la Parade, Que.	1 00
G. R. McDonald, St. Anne's G. T. R., below Que.	50
E. Connell, St. Charles, Que.	2 00
W. Nichols, St. Hubert, Que.	1 00
G. H. Wilkinson, St. Johns, Que.	1 00
W. H. Drumm, St. Johns, Que.	50
R. Hanna, St. Johns, Que.	25
Wm. Robertson, St. Mary's, Ont.	1 00
T. Wistor, Stratford, Ont.	2 00
G. Wardle, Stratford, Ont.	1 00
A. McNaughton, Stratford, Ont.	25
E. H. Scott, Stratford, Ont.	25
C. K. Ogden, Three Rivers, Que.	2 00
Jos. Pilon, Three Rivers, Que.	1 00
Albert Young, Three Rivers, Que.	25
A. H. Edwards, Thurso, Que.	1 00
J. Fraser, Thurso, Que.	1 00
L. Brown, Ticonderoga, N. Y.	*1 00
A. W. Bartlett, Tyendinaga, Ont.	50
N. H. Bourk, Upton, Que.	1 00
Miss Duffin, Valleyfield, Que.	1 00
Geo. Snyder, Vaudreuil, Que.	1 00
Miss Shearer, Vaudreuil, Que.	1 00
M. F. Springer, Waterloo, Ont.	1 00
E. M. Marshall, Waterloo, Que.	1 00
M. W. Wells, Windsor, Que.	1 00

BELLEVILLE, ONT.

J. W. Thompson, mangr.	$1 00	F. R. Haynes	$ 25
W. E. Thompson	1 00	*G. T. R. Station.*	
R. Ellbeck	30	John Kelly	1 00
Pike	50	W. Hambly	30
			$4 75

HAMILTON, ONT.

G. Black, Manager $2 00

Operators.		*Messengers.*	
A. B. Smith	1 00	W. Hover	25
J. C. Bale	1 00	H. B. Meredith	50
W. J. Ussery	50	W. Cooke	25
C. H. Tweed	50	W. Wade	25
A. Clark	25	R. Somerville	50
Entry Clerks.		W. Rousseaux	25
J. H. Moore	50		
A. Stinson	25		$8 00

MONTREAL OFFICE.

Operators.		W. Wilson	25
J. S. McKenzie	$1 00	A. Morrison	25
L. Longmore	1 00	E. Adam	25
A. McNaughton	1 00	E. McIntyre	25
T. J. Grier	1 00	*Messengers.*	
T. F. Sinclair	1 00	Sanderson	25
Geo. J. Scott	1 00	Turner	25
H. Wallace	1 00	Robertson	25
W. J. Grier	1 00	Wallis	25
J. S. Chaudinman	1 00	Felkin	10
A. McDonald	1 00	McCaw	25
J. Cochrane	1 00	Harris	15
J. Kent	50	Potter	20
W. Moner	50	Garratt	25
Entry and Checking Department		Jones	15
		Pagan	15
W. J. Graham, cashier	2 00	Wilson	25
W. Matthews	1 00	Mosner	25
H. S. Baker	50	McGregor	15
E. McConnell	50	Britt	25
G. T. Turner	25	Ellis	15
G. Reid	25	Brown	25
John Wilson	25	Jaunell	25
John G. Watson	25	Reid	20
J. McRobie	25	Hasley	25
W. P. A. Douglas	25	Kennedy	10
Receiving and Delivery Department.		Darrach	25
		Carroll	10
D. Duncan	25	O. Boene	10
J. Connor	25	Heathorn	35
W. Gray	25	Chisholm	15
W. Orr	25		
H. Douglass	25		$37 30

MONTREAL GRAND TRUNK STATION.

D. McCarthy	1 00	J. Roberts	1 00
Jno. Daley	1 00	Jas. Conway	1 00
M. Swift	50		
			$4 50

OGDENSBURG, N. Y.

J. P. Henderson, manager	$2 00	R. B. Tobey	1 00
Operators.		*Messengers.*	
C. Comstock	1 00	W. J. McCauley	50
J. Ingram	1 00	T. J. Payne	50
R. McCauley	1 00	J. Carty, repairer	1 00
E. J. Webbs	1 00		
E. J. Lancto	1 00		*$10 00

OTTAWA, ONT.

N. W. Bethune, manager	$5 00	*Clerks.*	
Operators.		F. E. Hurley	1 00
Jas. A. Parr	2 00	W. J. Burns	1 00
O. Hegman	1 00	A. Berry	1 00
Thos. Dunlop	1 00	T. L. Hackett	1 00
J. R. Battle	1 00	J. Hurley	25
J. Atcheson	1 00	L. Steary	50
W. H. Beswarick	1 00	J. W. McLaren	50
C. T. Jones	1 00	C. Lyman Fortier	50
G. McDonald	1 00	*Messengers.*	
J. M. Taylor, station agent, formerly operator	1 00	J. McMullen	25
		T. Kehoe	25
H. Burker, Jr., operator, St. Lawrence & O. Ry.	1 00	W. Maher	25
		S. Ebbs	23
Repairers.		A. Jones	25
P. St. Denis	1 00	J. Attwood	25
P. Kelly	75		
			$25 00

PEMBROKE, ONT.

G. Ford	$1 00	Jas. Gorman	25
G. McLauchlin	50		
A. A. Tuglee	25		$2 00

PLATTSBURG, N. Y.

W. Dow, manager	$3 00	*Operators.*	
Operators.		J. R. Duggan	50
S. Rogers	1 00	Napoleon Bailey	25
C. T. Richardson	1 00		
J. N. Hill	1 00		$*6 75

QUEBEC, QUE.

E. Pope, manager	$3 00	H. Paton, receiving clerk	$1 00
R. McCord, operator	1 00	Miss A. Noble, operator	75
John Lankshell, operator	1 00		
J. Barclay, operator	1 00		$7 75

TORONTO, ONT.

		Operators.	
H. P. Dwight, Western Superintendent	5 00	Jas. Anderson	1 00
B. B. Toye, manager	2 00	W. Blair	1 00
J. Foster, instrument maker	1 00	W. Nolan	1 00
		R. Preston, cashier	1 00
Operators.		W. P. Battin, book-keeper	1 00
R. F. Eason	1 00	P. R. Marling, bookkeeper	1 00
A. Hunter	1 00	*Clerks.*	
R. Storey	1 00	J. Mullen	25
J. L. Curry	1 00	R. Cuppage	25
W. J. Purdon	1 00	W. Cullen	25
J. Houlahan	1 00	D. Lewis	25
A. Bennett	1 00	T. J. Mullen	50
A. McPhie	1 00	B. J. Mullen	50
J. W. Reynolds	1 00		
W. Bennett	1 00		$26 00

WATERTOWN, N. Y.

D. Van Ostrand, manager	1 00	E. Harmon, operator	50
W. D. Hanchette, operator	50		
G. Webb, operator	50		$*3 00
M. Boucher, repairer	50		
			$290 21

In currency, sums marked *	$38 75
In gold, $250 46	282 39—$321 14

TENNESSEE.

JAMES D. REID, *Esq., Chairman, &c.*

DEAR SIR: As an evidence of the veneration that we in the Sixth District have for the Father of the Telegraph, and of our approbation of the happily conceived plan to erect a statue to his memory, inclosed find the sum of $162 50 as our contribution to the Morse Testimonial, with the names of subscribers. The telegraph fraternity of the United States we are in the habit of regarding as a great republic in itself, and Prof. Morse as its honored chief and founder. He bears the same relation to this great Telegraph Republic that Washington did towards the United States Republic, and is truly first in the hearts of all who are associated with the telegraph. We know no North, no South, no East, no West in this great confraternity, but are united in heart and sympathy by bonds as close and sentiments as responsive as those which tie together the intelligence of the world through the invention of Morse. The statue must be erected by his grateful co-laborers, and the fact thus demonstrated that those who work with his mighty instruments most gratefully appreciate his genius and worth. Very respectfully, your obedient servant,

J. COLEMAN, Supt.

James Coleman, supt.	$10 00	W. H. Nichols, opr.	$2 00
Mont Pepper, loin mang.	3 00	E. W. Clowes, opr.	2 00
Glynn M. Baker, mang.	5 00	Az. Willshire, opr.	2 00
P. J. Murray, receiver	2 00	W. O. Woodson, C. N. D.	2 00
Sam A. Pepper, del'y clk	2 00	H. A. Montgomery, retired	5 00
Joe C. Baker, bookkeeper	2 00	Geo. C. Harlan, retired	2 00
Chas. C. Marable, clerk	2 00	H. A. Galliher, retired	2 00
M. L. Wynatt	2 00	D. Shay, foreman	2 00
D. O. Dyer, chief opr.	5 00	And. J. Collins, repairer	2 00
Joe J. Fowler, asst.	5 00	And. J. Griffith, mess'gr.	1 00
J. L. Martin, operator	2 00	Wm. B. Kirk, mess'ger	1 00
Ed. Schermerhorn, opr.	2 00	Amos Kibbe, messenger	1 00
Chris Reilly, opr.	2 00	James Cox, messenger	1 00
Cornelius McCarthy, opr	2 00	Wm. H. Mynatt, mess'r.	1 00
Archie Craig, opr.	2 00	Wm. W. Brown, mess'gr.	1 00
Chas. A. Stearns, opr.	2 00	Wm. H. Joyce, clk. boy	1 00
Marco T. Paoli, opr	2 00	Dave Scott, janitor, (col'd)	1 00
Chas. A. Kellogg, opr.	2 00		

Irwin Dugan, operator, Peabody Hotel	$2 00
J. E. Griffith, operator, Overton Hotel	2 00
Charles A. Gaston, operator, Madison St. Office	2 00
William Mulford, operator, M. & C. Depot	2 00
John T. Spear, operator, M. & Louisville R. R. Depot	2 00
G. M. Robertson, operator, M. & Tennessee R. R. Depot	2 00
P. T. Smythe, operator, Paris, Tennessee Depot	3 00
Jac. Whitney, operator, Paris, Tennessee Depot	1 00
O. D. Bartholomew, operator, Humboldt Depot	1 00
W. F. Johnstone, operator, Brownsville	2 00
D. G. Breed, clerk, M. & Louisville R. R., Paris	1 00

Operators.

Emmett Howard, Humboldt, Tenn.	$5 00
Chas Lofland, Sardis, Miss	5 00
Wm. M. Ross, McKenzie, Tenn	2 50
Thos. F. Marshall, Grenada, Miss.	2 00
W. T. Harrison, Bells, Tenn.	2 00
J. P. Sensing, Gadsden, Tenn.	1 50
W. G. Marshall, Aberdeen, Miss	1 25
C. W. Priddy, Bartlett, Tenn	1 00
William N. White, Mason, Tenn., second remittance	1 00
N. Williams, Brownsville, Tenn.	1 00
C. Curtiss, Danville, Tenn	1 00
J. H. Pearce, Clarksville, Tenn.	2 00
Jno. Morris, Stanton, Tenn.	1 00
B. J. Corban, Corbandale, Tenn.	1 00
W. B. Nolley, White, Tenn	1 00
A. W. Loving, Galloway, Tenn.	1 00
Wm. Tilley, Paris, Tenn	1 00
A. G. Love, Trezevant, Tenn	1 00
Jno. R. Glover, Erin, Tenn.	1 00
W. M. Marshall, Batesville, Miss	1 00
James M. Henderson, Sardis, Miss.	1 00

Repairers.

Sam Roberts, Humboldt, Tenn.	$2 00
Ernest Purath, Paris, Tenn.	2 00
Joe McCarthy, Guthrie, Ky.	2 00
Jno. Gaslin, Bowling Green, Ky.	2 00
Mike Conlan, Grenada, Miss	2 00

J. C. Harvey, train dispatcher, Clarksville, Tenn.	2 00
Freight Depot Office, Clarksville, Tenn	1 00
Frank Plosser, messenger, Clarksville, Tenn.	25
Schloss & Wolff, landlord's office, Clarksville, Tenn	75
H. C. Cox, operator, Big Sandy, Tenn	2 00
J. G. Nicholson, night train dispatcher, Memphis	1 00
G. H. Curtiss, operator, Bowling Green, Ky.	1 00
Jno. Galvin, operator, Bowling Green, Ky.	1 00
W. G. Wilson, operator, Russellville, Ky.	1 00
Fred. W. Palmer, operator, Clarksville, retired operator	75
Geo. M. Dugan, operator, Bolivar, Tenn.	2 00
Frank McGlathery, assistant, Bolivar, Tenn.	1 00
James C. Davis, Carbondale, Tenn.	50
	$162 50

STILL ANOTHER.

Here is another list of subscribers to the Morse Testimonial and the money, $56.

Chicago, Ill. R. C. RANKIN.

F. S. Kent, manager, Cairo, Ill.	$1 00
Theo. Carrigan, operator, do	1 00
Fin. M. Hall, operator, do	1 00
A. A. Smith, jr., repairer, do	1 00
Willie W. Coe, messenger	50
Daniel Hogan, operator, Mound City, Ill.	1 00
Charles Wallace, operator, Mounds, Ill.	1 00
C. M. Stimson, operator, Washington, Iowa	1 00
J. M. Smith, operator, Young America, Ill.	1 00

FROM THE OTTAWA SHOPS.

A. Henning, supt.	$3 00	James Egan	$2 00
J. C. Warner	3 00	L. Schrauer	1 00
F. P. Duplaine	2 00	J. A. Sternberg	1 00
Henry Kocha	3 00	Ralph Osborn	1 00
C. W. Cook	2 00	Wm. Killian	1 00
P. J. Frew	2 00	Hugo Vogle	1 00
H. Hamstein	3 00	Jno. Hoffman	1 00
O. Scherler	2 00	Chas. Stief	50
W. M. Goodridge	1 00	Charles Warner	50
J. Van Buren	50	Jno. Mentor	50
F. C. Lambert	1 00	Arthur Mears	50
A. S. Wetmore	1 00	Sam Hetheld	1 00
Jno. Phillips	1 00	H. Weyd. Knecht	1 00
S. E. Morley	1 00	B. F. Strickler	1 00
Isaac Bowen	1 00	J. Swanson	1 00
C. F. Uhl	1 00	Millard Bruce	50
D. Hoffman	1 00		
			$56 00

POTTSTOWN, Pa.

DEAR SIR: Herewith receive our mite to the Morse Testimonial. It is cheerfully given. Wish we had more to "do likewise."

HANNAH L. BROWER.

G. W. Nicolls, operator, Pottstown, Pa.	$1 00
M. P. Janney, student	1 00
W. W. Mintzer, manager R. R. office	1 00
Z. M. Savage, manager, night service	1 00
Hannah L. Brower, manager, Pottstown	1 00
A friend we induced to "do likewise"	1 00
Another	1 00
	$7 00

Well done, Miss Brower.

MISCELLANEOUS.

John Campbell, Carlisle, Pa.	$4 00
C. H. Edwards, opr., Pollard, Ala.	2 00
C. Barry, repairer, Pollard, Ala.	1 00
H. G. Nightingale, New York	1 00
O. N. Cuthank, manager, Fort Laramie, Wy.	1 00
J. A. Remley, Edgefield Junction, Tenn.	1 00
J. M. Davis, manager, Spring Hill, Tenn.	2 00
E. W. McGaughery, manager, Bridgeport, Ala.	1 00
J. P. Bogert, Port Treverton, Pa.	1 00
W. F. Holloway, Norfolk, Va.	2 00
K. C. Murray, Norfolk, Va.	1 00
Horace Waters, New York	1 00
L. T. Lindsey, Jackson, Tenn.	5 00
V. Pepper, manager, Towners, N. Y.	1 00
George T. Wilkins, Bradford, N. H.	1 00
Abe Kern, Cincinnati, O.	1 00
E. Sill, Clifton, Ill.	1 00
Robert Parker, manager, Remington, Ind.	1 00
John Bradley, operator, M. & C. R. R., Huntsville, Ala.	1 00
Charles Lehr, Bremen, Ind.	2 00
G. W. Davis, manager, Galveston, Ind.	1 00
James R. Ash, Lamokin, Pa.	1 00
G. Garten, Central St. Station, Baltimore, Md. (omitted in Tenth Dist. E. D. list)	1 00

Dear Sir: Inclosed please find additional contributions to the Morse Testimonial Fund. Truly yours,

Corinth, Miss. Thomas Johnson.

W. W. Polk, manager, West Point, Miss.	$1 00
S. C. Turner, opr., Bethel, Tenn.	1 00
John H. Seaborne, foreman repairs, Miss.	5 00
M. L. Gilbert, repairer, Miss.	2 00
C. W. Terrell, repairer, Miss.	1 00
E. A. Brown, repairer, Corinth, Miss.	2 50
W. A. Steger, opr., Moscow, Tenn.	1 00
T. P. Steger, opr., Moscow, Tenn.	1 00
Peter Fowler, manager, Paducah, Ky.	2 00
John Conner, repairer, Paducah, Ky.	1 00
J. Holloran, messenger, Paducah, Ky.	50
	$18 00

F. AND P. M. RAILROAD, MICHIGAN.

James Green, East Saginaw,	Michigan	$2 00
F. W. Hunter, East Saginaw,	"	1 00
N. C. Folsom, East Saginaw,	"	1 00
H. H. Stebbins, Averille,	"	1 00
James Hays, Midland,	"	1 00
D. E. Barrett, Freelands,	"	1 00
J. Handford, Gr. Blanc,	"	1 00
J. H. Tolfree, East Saginaw,	"	1 00
W. S. Taylor, Mount Morris,	"	1 00
Abner Horton, Pine Run,	"	1 00
C. J. Slafter, Birch Run,	"	1 00
W. Metcalfe, Bridgeport,	"	1 00
E. Miller, Holly,	"	1 00
		$14 00

Long Branch, N. J.

Dear Sir: Inclosed please find our subscription to the Morse Testimonial. I am open to a second call, and I think I can speak for all the rest. Yours, J. Mitchell.

J. Mitchell, manager	$2 00
R. Battin, opr., West End, second subscription	1 00
J. W. Mead, opr., second subscription	1 00
L. G. Bliss, opr., R. R. Depot	1 00
C. W. Page, opr., R. R. Depot	1 00
Geo. Dixon, lineman	1 00
	$7 00

CALIFORNIA.

San Francisco, Sept. 8, 1870.

Dear Sir: Inclosed find $110 18 from a few of the telegraphic fraternity on this coast. Were not times so hard the sum would have been much larger. We hope the total subscription will be enough to erect a statue worthy of the man.

Yours, &c., J. W. Brown.

SAN FRANCISCO.

J. S. Urquhart, manager	$3 00	Geo. Sawyer, operator	$1 00
J. W. Brown, ch. opr.	3 00	J. J. Salding, "	1 00
C. P. Hoag, operator	1 00	Wm. Foley, "	1 00
A. H. Post, "	1 00	F. George, "	1 00
J. D. Weems, "	1 00	C. B. Burch, "	1 00

SACRAMENTO OFFICE.

John F. Allen, mgr.	$3 00	L. W. Storror, ch. opr.	$1 00
Wm. Spinner	1 00	Ch. J. Thomas, opr.	1 00
E. L. Pearson	1 00	J. H. Thatcher, "	1 00
John Leatch	1 00	Ch. H. Hubbs, "	1 00

VICTORIA, VANCOUVER'S ISLAND.

F. H. Lamb, supt., Victoria	$5 00
R. B. McMicking, opr., Victoria	1 00
L. J. Sellon, Bakersfield, Cal.	2 50
Alonzo Coone, Santa Clara, Cal.	1 00
C. J. Shepherd, Los Angeles, Cal.	2 50
Chas. Davis, San Rafael, Cal.	2 00
Chas. E. Street, Sonora, Cal.	2 00

PORTLAND, OREGON.

J. Guild, manager, Portland	$2 00
W. J. Leahy, opr., Portland	1 00
C. W. Goodwin, opr., Portland	1 00
O. O. Tibbetts, opr., Portland	1 00
B. F. Richtmyer, opr., Drytown, Cal.	2 00
A. Gonzales, opr., Monterey, Cal.	2 00
A. M. Ardery, opr., Reno, Nevada	2 50
J. Dotchert, opr., Santa Rosa, Cal.	[illegible] 00
A. P. Lovejoy, opr., Petaluma, Cal.	5 00
J. F. Bolden, opr., Watson's Ferry, Cal.	2 50
C. O. McGrew, opr., San Louis Ranch, Cal.	2 00
John Dittmer, opr., Timbuctoo, Cal.	2 00
W. W. Turner, opr., Jacksonville, Oregon	2 50
E. L. McClure, opr., Dutch Flat, Oregon	5 00
R. Ollivier, opr., Gordon's, Cal.	2 00
Y. P. Villegas, opr., San Juan, Cal.	2 00
J. R. Stoddard, opr., Trinity Centre, Cal.	2 50
John Muir, opr., Rocklin, Cal.	1 00
J. F. Swain, opr., Benicia, Cal.	1 00
C. R. Holbrook, opr., Benicia, Cal.	1 00
C. T. Swain, opr., " "	50
C. C. Swain, opr., Martinez, Cal.	1 00
E. Jungerman, opr., Black Diamond, Cal.	1 00

All these paid in gold.

The following are in currency:

Addison Beck, Georgetown, Cal.	1 00
Ed Martin, Watsonville, Cal.	2 00
Volney Calvig, Canyonville, Oregon	2 00
J. B. Carder, Iowa Hill, Cal.	2 00
Ben C. Shearer, Coloma, Cal.	2 50
W. W. Skinner, Oakland, Oregon	1 00
William Wright, Puyallup, Washington Territory	1 30
Wallace Baldwin, Corvallis, Oregon	1 00
J. Q. Stewart, " "	1 00
C. O. Heanan, Santa Cruz, Cal.	2 50
	$99 50
Premium on gold, &c.	10 68
	$110 18

Elko, Nevada, 1870.

Dear Sir: Inclosed find check for $11 for the Morse Testimonial, credited as follows. Yours truly, W. J. Hamilton.

William Logan, Kelton, Utah	$5 00
Walter Davis, Carlin, Nev.	2 00
W. J. Hamilton, Elko, Nev.	2 00
N. L. Boydston, Oreana, Nev.	1 00
James H. Reid, Oreana, Nev.	1 00

OHIO AND MISSISSIPPI RAILROAD TELEGRAPH.

Here comes a list headed by one of our old boys:

Charles W. Temple, Supt., Vincennes, Ind.	$5 00
A. Hayward, div. operator, do	1 00
J. C. Watts, operator, do	1 00
P. Hood, operator, do	1 00
H. Flanders, operator, do	1 00
W. P. Larimer, extra, do	1 00
William Musgrove, operator, Lawrenceville, Ill.	1 00
William D. Gilpin, operator, Sumner, Ill.	1 00
C. G. Wallace, operator, Olney, Ill.	1 00
Geo. T. Pionell, operator, Noble, Ill.	1 00
J. W. Hanker, operator, Clay City, Ill.	1 00
R. F. Duff, operator, Clay City, Ill.	1 00
S. D. Joynes, operator, Xenia, Ill.	1 00
S. Hussey, operator, Salem, Ill.	1 00
W. H. Wheedon, operator, Iuka, Ill.	1 00
F. Landenberger, operator, Odin, Ill.	1 00
Samuel Rumer, operator, Sandoval, Ill.	1 00
J. C. Fisk, agent, Collins, Ill.	1 00
F. E. Norcross, operator, Carlyle, Ill.	1 00
J. Green, operator, Breese, Ill.	1 00
Wm. D. A. Ewing, operator, Trenton, Ill.	1 00
Theo. Wilcox, operator, Lebanon, Ill.	1 00
R. C. Musgrove, operator, Lebanon, Ill.	1 00
D. W. Bushnell, operator, Alma, Ill.	1 00
Z. E. Gunn, operator, Caseyville, Ill.	1 00
Geo. R. Bicknell, operator, St. Louis, Mo.	1 00
H. B. Wallace, operator, Wheatland, Ind.	1 00
J. R. Clark, operator, Washington, Ind.	1 00
H. A. Rogers, operator, Washington, Ind.	1 00
J. W. Montgomery, operator, Montgomery, Ind.	1 00
D. A. Goodin, operator, Loogootee, Ind.	1 00
J. E. Hall, operator, Shoals, Ind.	1 00
J. T. Davis, operator, Huron, Ind.	1 00
J. H. Crim, operator, Mitchell, Ind.	1 00
H. Bartlett, operator, Tunnelton, Ind.	1 00
G. D. Thomas, operator, Tunnelton, Ind.	1 00
C. C. Frey, operator, Medora, Ind.	1 00
R. H. Sawyer, operator, Brownstown, Ind.	1 00
Charles P. Frey, operator, Seymour, Ind.	1 00
T. W. Kennon, div. operator, North Vernon, Ind.	1 00
S. S. Morris, operator, North Vernon, Ind.	1 00
Will H. McMahon, operator, North Vernon, Ind.	1 00
Ed. M. Wallace, operator, Deputy, Ind.	1 00
A. Beecher, operator, Lexington, Ind.	1 00
H. C. Harris, operator, Jeffersonville, Ind.	1 00
J. H. McGuinness, operator, Louisville, Ky.	1 00
T. Kelly, operator, Nebraska, Ind.	1 00
T. G. Van Meter, operator, Holton, Ind.	1 00
H. B. Montgomery, operator, Osgood, Ind.	1 00
Wm. J. Robinson, operator, Osgood, Ind.	1 00
A. Goodin, operator, Milan, Ind.	1 00
M. M. Riggin, operator, Moore's Hill, Ind.	1 00
G. A. Temple, operator, Cochrane, Ind.	1 00
T. P. Brown, operator, Cochrane, Ind.	1 00
A. J. Frazier, operator, Aurora, Ind.	1 00
H. O. Hewetts, operator, Lawrenceburgh, Ind.	1 00
S. P. Patterson, operator, Delhi, O.	1 00
J. Stafford, operator, Storrs, O.	1 00
J. W. Hunt, operator, Cincinnati, O.	1 00
T. C. Allen, operator, Cincinnati, O.	1 00
William Frey, operator, Cincinnati, O.	1 00
George Heitz, repairer, Vincennes, Ind.	1 00
	$66 00

Inclosed please find the money, $66.

Yours truly, A. Hayward, Manager.

◆

Upon the earnings of the Electric and International Telegraph Company, England, for seven months ending January 1, 1870, we see that 12½ per cent. of a dividend has been declared. That is a very comfortable state of affairs.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
October 1, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Sept. 15, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

486 Anderson, Texas, reopened.
362 Allene, Ind.
397 Ashland, Iowa.
436 Agency Ford, Mo.
212 Ashley, O.
374 Beauregard, Miss.
* Cochran, Ga.
388 Delta, La.
30 Derby Line, Vt., heretofore "other line" office.
18 Duxbury, Mass., reopened.
141 Dunbar, Pa.
362 Duck Hill, Miss.
* Eastman, Ga.
437 Gower, Mo.
Golden City, Col., reopened tariff same as Central City, Col.
* Lumber City, Ga.
96 Bream's Station, Va.
Santa Barbara, Cal., tariff same as Los Angeles, Cal.
340 Saulsbury, Tenn.
San Buenaventura, Cal., tariff same as Los Angeles, Cal.
307 Willow Springs, Ill.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.	*Leaves this Line.*
Lumber City, Ga., Eastman, Ga., Cochran, Ga.,	50 5	Macon, Ga.
Douglass, Ont., Petawawa, Que.,	same as Pembroke, Ont.,	same as Pembroke, Ont.
Roxton Falls, Que., Ayers Flats, Que.,	same as Acton, Que.	same as Acton, Que.
Farrands Point, Ont., La Prairie, Que.,	same as Dundee, Que.,	same as Dundee, Que.
Labaie, Que., St. Guillaume, Que., Drummondville, Que.	same as Danville, Que.,	same as Danville, Que.

OFFICES CLOSED.

Caldwell, N. Y.; Cresson Springs, Pa.; Lake Mahopac, N. Y.; Mount Pleasant, Del.; Mount Vernon, N. H.; Newnan, Ga.; Old Sweet Springs, W. Va.; Sweet Chalybeate Springs, Va.; Stone Mountain, Ga.; Trenton Falls, N. Y.; Norwood, N. J.; Cornwall, N. Y.; Aaducah Junction, Tenn., and Wyoming, Del.

GENERAL INFORMATION.

SANTIAGO DE CUBA AND KINGSTON, JAMAICA.

We are notified by the Cuba Cable Company of the following rates of tariff, in gold, to offices opened on the lines of the West India and Panama Cable Company:

From.	*To Santiago de Cuba.* 10 words.	*To Santiago de Cuba.* *Add'l words.*	*To Kingston, Jamaica.* 10 words.	*To Kingston, Jamaica.* *Add'l words.*
Offices in United States, east of the Mississippi River, including St. Louis	$6 25	$ 58	$ 6 75	$ 78
Offices in United States west of the Mississippi River, excepting St. Louis	9 00	90	11 50	1 15
New Brunswick and Nova Scotia	7 25	63	9 75	88
Canada	6 75	58	9 25	83
Newfoundland	8 75	78	11 25	1 03

Address, date and signature to be counted.

ATLANTIC CABLE BUSINESS.

Tariff to Spain "via Falmouth," is made $3 75 for twenty words, from London, instead of $2 25.

The following rates "via Falmouth" are given in addition to those before noted:

From London, for twenty words or less.

To Benghazi	$5 88	Suez Canal, all stations	$9 00
To Tripoli	4 25	Belgium	4 38
To Denmark and Greece	4 50	Norway and Sweden	5 00

The route to India "via Falmouth," is interrupted by a break in the cable.

There are two Sheffields in Ill. Sheffield in square 336 is in Bureau County, and Sheffield square 348, new office in last Journal, is in Greene Co.

Business for Brunswick, Ga., will hereafter leave our line at Macon, Ga., instead of Jessups. Tariff for "other lines" remain unchanged.

Eastern offices should check *gold rates* on business *paid in Pacific Division.* Many offices now check offices in *Pacific Division currency rates* on messages paid there in gold, and check errors are thus largely increased.

WILLIAM ORTON, President.

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

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has already been quite extensively introduced, and it is confidently believed, that by the natural laws of progression, is destined to supersede iron wire for Telegraphs, because of its superior working capacity under all conditions of weather.

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By this plan it is the resistance itself which is

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the whole being contained in a small box which a man can easily take in one hand like a valise.

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TROY,
NEW HAVEN,
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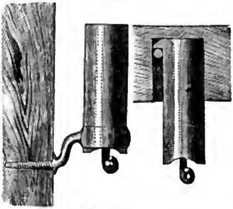

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1st. A current resistance in rain or fog, or in rain and combined of 100,000,000,000 Siemen's mercury units.

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It is not injured by missiles in the general acceptance of the term.

It does not depreciate from exposure to smoke, soot and the gases from combustion to one hundredth part of the extent of ordinary insulators.

It is not injured by atmospheric discharges. It is a protection to the poles from the same effects, there not being an authenticated instance of a pole being injured where these insulators are used.

JOHN POLHEMUS, Printer and Stationer, 102 Nassau Street, N. Y

JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 22. NEW YORK, OCTOBER 15, 1870. WHOLE NO. 72.

THE MORSE STATUE.

We owe it to the numerous subscribers to the Morse Testimonial Fund, who, from all parts of the continent, have so promptly and cheerfully sent us their gifts, to state to them how happily and successfully the movement progresses.

The subscription for the statue has now reached $5,500, leaving only $500 to complete the payment of the sculptor, who has enthusiastically and laboriously pushed forward his work, and of whose ultimate success we have the highest hopes. That this sum will reach us, we have not the slightest doubt. Yet we hope no one will delay any design he may have formed to connect himself with this generous and animating work, merely to try our faith. We shall need much more money to complete the whole design.

The work of the artist in preparing the model is almost completed, and Mr. Pickett assures us that not more than a fortnight will elapse before the chisel commences its work on the marble. We say this in full expectation that his work will prove so complete as to be accepted by the critics who are to record their favorable judgment before we receive it from his hands, and that in our next number we will be able to publish the report of the examining committee.

The following from one of the most reliable of our city papers we give as important unsought testimony to the work of the artist:

THE MORSE STATUE.

From the New York Evening Post.

The colossal statue of Professor Morse, intended for Central Park, now in the hands of the sculptor, is rapidly assuming in its grand proportions the imposing appearance of the finished work.

Mr. Pickett, the sculptor, is devoting his whole time and study to its perfection, and the result, thus far, in the working up of the clay model, is a magnificent success. The figure is designed standing erect, with the right hand slightly raised; a cloak is thrown over the right shoulder and falls in graceful folds over the arm to the hand, which is extended and open. The left arm rests upon a pedestal, with the hand hanging over its side, holding a strip of paper bearing a cabalistic sentence as written by the telegraphic instrument. The left foot of the figure is slightly raised, which renders the position remarkably easy.

The design of the sculptor in the position of the figure in general, and in that of the head and the hands in particular, is to express the idea that the inventor of the telegraph, on receiving the first message, as the result of his labor, holds the strip of punctured paper in his extended hand, and after musing over it for the moment suffers his left hand to fall at his side, still holding the precious scroll, while with his right hand yet extended, and his head raised in reverence, he utters the words: "Thank God, my work is done."

The proportions of the figure in its present unfinished state appear to be good. The height of the statue is seven feet, and it is designed to stand on a pedestal of the same elevation, making the entire altitude of the statue and pedestal fourteen feet. The figure is to be executed from a block of Vermont marble, the gift of Messrs. Tilton & Goodell, owners of the quarries.

The statue when erected is to be sheltered from the storm and sunshine of our variable climate by an ornamental dome of iron, supported by four Corinthian columns.

Its position in the Park has not yet been decided upon.

The writer of the foregoing we do not know. It forms one of the leaders in a paper where no puffery is permitted. The article is, to our own mind, strictly just, and eminently truthful and exact. We believe that, as a work of pure art, the statue will prove one of surpassing excellence. The patience and taste of the artist as he manipulates the clay, devoting days to a single fold of the costume, or a feature of the face, or a wrinkle on the brow, shows that he designs that no imperfect thing is to bear his name.

It is not the least gratifying circumstance connected with this matter, that specimens of marble have recently been found in Vermont of a grain closely resembling and of a deeper and richer tint than the Carrara marble of Italy, which latter we had insisted on securing because of its resisting qualities, as well as for the possession of that warm, fleshly tint which gives so much of life to the statuary in which it is employed. Most of our home marble is too soft, too porous, to bear exposure. The grain of this recent discovery renders it at once absorbent of the light and non-absorbent of the rain, the first giving depth and richness, and the latter resistance to decay. Thus assured that from our own quarries this statue can be formed, it is an element of success for which we were not prepared, and in which we greatly delight.

We are delighted also to state that the New York Park Commissioners have with much cordiality and unanimity voted the statue a place in Central Park.

The following are the letters on the subject:

NEW YORK, July 22, 1870.

PRESIDENT OF THE BOARD OF COMMISSIONERS OF THE CENTRAL PARK, CITY OF NEW YORK.

SIR: The telegraph operators of the American Continent having determined to erect a marble statue in honor of Professor S. F. B. Morse, and which shall also in the excellence of its execution faithfully represent the advanced condition of American art; I have the honor, on their behalf, to ask you to grant a place in Central Park for that purpose. Professor Morse's fame rests on a basis so permanent, so cosmopolitan and beneficent that it leads us to the assurance that you will assign to our use some distinguished spot in the beautiful grounds under your control. It is our desire to lay the foundations and pedestal without delay, and have the statue unveiled by the President of the United States on Professor Morse's eightieth birthday, April 27, 1871. I have the honor to be your obedient servant,

JAMES D REID,
Chairman Morse Testimonial Fund.

PETER B. SWEENY, Esq., President of the Board of Commissioners of the Public Parks of the City of New York.

SIR: I had the honor to address you in July, stating that a movement had been commenced throughout the country having for its design the erection of a marble statue of Professor Morse, commemorative of his great invention and its vast influence on the history of the world. This design has been received with so much enthusiasm from all sections of the country that I have already had placed within my hands sufficient funds for its accomplishment. The artist's model is also about ready for the chisel, and the City of Charlestown, Mass., has just voted an appropriation for a suitable base, that city having been the place of Professor Morse's birth.

From all quarters a desire has come that the statue be erected in the New York Central Park. It will be a work of the highest art. It is to honor a man whose work is accomplished and whose life is nearly closed. In the name of thousands who have sent me their funds, and of millions whom his invention has blessed, I respectfully ask that this statue of Professor Morse be permitted to be erected in Central Park and that an honorable place be assigned for that purpose. I have the honor to be your obedient servant,

JAMES D. REID,
Chairman Morse Testimonial Fund.

NEW YORK, September 20, 1870.

The following is the response:

CITY OF NEW YORK,
DEPARTMENT OF PUBLIC PARKS,
October 8, 1870.

SIR: At a meeting of the Department of Public Parks, held October 4, 1870, the following resolution was adopted:

Resolved, That the application for the erection of a statue to Professor Morse in Central Park be accepted and approved, and the request be granted. That it be referred to a special committee of two to select a place for locating the same, with power to impose such conditions in respect thereto as may be deemed advisable.

Commissioners Hilton and Dillon were appointed such committee. Respectfully,

GEO. M. VAN NORT,
Comptroller D. P. P.

JAMES D. REID, Esq.,
Chairman, &c.

We very much regret an error in the above correspondence, into which we were led by an announcement in a Boston paper of the passage of an act appropriating money for a base for the statue. This being confirmed by the statement of a friend from Boston, we inserted it as a gratifying fact in our letter. The Board of Alderman did so act. It was, however, negatived in the Council by a single vote. Technical and legal difficulties were urged against the gift, very much to the chagrin of many of its members. The cost of the base will therefore have to be obtained by private subscription, which will no doubt be speedily secured.

One word more. In this work we have no men backing us to provide money to complete the design and its necessary expenses. We shall need at least $2,500 to erect a base, the plans for which are now maturing in the hands of a skillful architect. Funds will also be needed to pay many expenses connected with the inauguration which we design shall be august and national. We need also funds suitably to record the proceedings, and provide, if possible, all concerned with memorial copies. We can only promise carefulness and loyalty in this delightful trust. We shall give the record of what is received and spent, and have the utmost confidence that all needed money will come. All we fear is that some who are able and ought to give with generous promptness, will procrastinate until their gift is unneeded.

The canopy to cover the statue will be a distinct movement, of which we will speak when the designs and estimates are completed.

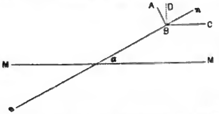
◆

SINE AND TANGENT GALVANOMETERS.

RELATION OF STRENGTH OF CURRENT TO ANGLE OF DEFLECTION.

The magnetism of the earth tends to hold a galvanometer needle in the magnetic meridian. This force is practically the same for all positions of the needle, and its effect on the needle is equal to the force multiplied by the sine of the angle at which it acts—namely, by the sine of the angle of deviation.

A current of electricity near a magnetic needle tends to hold the latter at right angles to the direction of the current. And when the current flows parallel to a galvanometer needle, it acts at right angles to the latter with its maximum force.



If M M be the magnetic meridian and *n* a needle held at the angle *a* with M M by a current parallel to *n s* we may represent the force of the current by the line A B perpendicular to *n s* and the force of the earth's magnetism by the line B C parallel to M M. These two forces produce an equilibrium, and therefore the force A B multiplied by the sine of 90—the force B C multiplied by the sine of the angle *d*, or, (radius being unity.)

A B—B C sin *a*.

In other words the strength of current in a galvanometer coil *parallel to the needle*, is proportional to the sine of the angle of deflection.

Suppose the galvanometer coils remain parallel to the magnetic meridian, and that the current acts on the needle with the same force at any angle which the needle may make with M M. The force of current might be represented by the line B D perpendicular to M M at the angle (90 d) with *n s*. Then, B D sin (90-d—B C sin d and dividing by cos. d.

B D—B C tan d.

In other words the strength of current in a galvanometer coil in the magnetic meridian, is proportional to the tangent of the angle of deflection, *when the current acts with equal force at every angle that the needle may make with the magnetic meridian.*

The needle may be made to act with an *approximately* equal force at the different positions of the needle by making the needle very short with respect to the diameter of the coil, or by making the coil very large, or by winding the coil on a section of a cone of which the centre of the needle occupies the apex. But unless the current acts at right angles to the needle, when deflected, or, remaining in the magnetic meridian, acts with equal force in any position of the needle, then the strength of current is not proportional either to the sine or to the tangent of the angle of deflection.

One important consideration in regard to a sine galvanometer will appear by examining the equation

A B—B C sin d

The sine of d is less than unity for any angle less than 90°. Therefore, A B must be less than B C. In other words, the strength of current must be less than the force of the earth's magnetism, or it cannot be measured by the sine galvanometer.

Suppose a needle showed 4° deflection for 1 farad of current. The sine of 4° is .07, and 14.28 farads would bring the needle to 90°, and thus be the limit of current which that instrument would measure.

The principles on which sine and tangent galvanometers are constructed, were stated by De la Rive, about thirty-five years ago. T.

◆

NOTES ON ELECTRICAL PHENOMENA.

FROM A COURSE OF LECTURES BY PROFESSOR TYNDALL, LL.D., F.R.S.

Influence of Time on Intensity of Discharge. The Condenser.

The intensity of the secondary current—its "discharging distance," for example—depends upon the rapidity with which the primary is interrupted.

I have already referred to the passage of particles between the two severed terminals of a circuit. By these particles the current may be kept up for a short time after the terminals have been disunited. A *gradual* dying away of the primary is the consequence.

But to produce the maximum secondary intensity it is necessary that the primary should be extinguished *at once.*

This is very effectually accomplished if the primary be broken between the poles of a strong magnet. The secondary spark may be thus made to overleap distances, vast in comparison with those possible to it when the rupture of contact occurs far away from the magnetic poles.

The magnet quenches immediately the stream of particles which accompany the spark. Thus, instead of being spread over a very sensible interval, the whole power of the primary is concentrated into an instant of time.

This concentration is announced by the loudness of the report of the primary spark. This augmentation of loudness was first observed by Page; it was explained by Rijke, who also exalted in the way here indicated the discharge of the secondary coil.

The injurious effect of the spark produced by the rupture of contact in Ruhmkorff's coil is much diminished by the employment of a condenser, which is attached to the primary. It was introduced by Fizeau.

Electric Discharge through Rarified Gases and Vapors.

The electricity from the prime conductor of an electrical machine passes through the air in the form of a dense and brilliant spark, which produces a very audible report.

When the discharge passes through rarified air the discharging distance is augmented, and by sufficiently rarifying the air the discharge may be caused to pass *silently*. It then fills the tube through which it passes with a rosy light.

This rosy light has the same origin as that of the Aurora Borealis: it is due to the nitrogen of the air.

Every attenuated gas has its own characteristic color when traversed by the electric discharge. When examined by a prism, the color resolves itself into distinct bands; the nature of the gas may indeed be inferred from the analysis of its spectrum.

The discharge of the induction coil through attenuated media produces luminous effects similar to those produced by the electric machine.

The tubes containing the attenuated gases of vapors are usually called *vacuum tubes*. Through the tubes pass platinum wires which are fused into the glass, and between which the discharge passes.

Such tubes are produced in great perfection by Geissler, of Bonn, and are sometimes called Geissler's tubes.

Under certain circumstances, the luminous discharge is composed of distinct luminous strata, separated from each other by dark intervals transverse to the direction of the discharge. These strata were first observed by Grove; they were first observed independently and finely developed by Ruhmkorff.

The luminous strata were believed to arise from the intermittent action of the contact-breaker of the induction coil; but Gassiot produced them both with the electric machine, and with his battery of 3,500 cells, where no contact-breaker is employed.

Every single discharge of the induction coil through a properly chosen medium resolves itself into a series of pulses, which declare themselves as a stratified discharge. Under similar circumstances the discharge from the voltaic battery also is resolved into a series of pulses which are declared by their stratifications.

Action of Magnets on the Luminous Discharge.

The luminous discharge is, to all intents and purposes, an electric current, and is acted on by a magnet like a wire carrying a current.

But the flexibility of the luminous current in rarified gases enables the magnet to act upon it in a manner peculiarly interesting and instructive.

Placing, for example, a tube through which the luminous discharge is passing between the poles of an electro-magnet, by exciting the magnet the stream of light may be either deflected or wholly extinguished.

In the latter case, by interrupting the current passing round the magnet, or by lifting the tube out of the magnetic field, the luminous discharge is restored.

In certain cases, when the luminous discharge consists simply of a feeble glow, the supervention of the magnetic force draws a series of strongly illuminated strata from the positive terminal of the vacuum tube; when the magnetism is interrupted, these strata retreat again in succession, as if swallowed up by the positive pole. A number of exceedingly beautiful experiments of this character has been made by Gassiot.

It has been stated in Note 306 that the discharges from the induction coil proceed always in the same direction; hence in each vacuum tube we have a positive terminal or pole, and a negative terminal or pole.

When the light surrounding the negative terminal is subjected to a magnet, it ranges itself exactly along the lines of magnetic force; the light at the positive terminal shows no such action. This discovery is due to Plucker.

Magnetic-electric Machines. Saxton's Machine. Siemens's Armature.

Faraday's discovery of magneto-electricity was announced in 1831. In 1833 a machine was constructed by Saxton for the more copious development of magneto-electric currents.

In it copper-wire coils, within which were placed cores of iron, were caused to rotate before the poles of a powerful magnet.

On the approach of a coil to one of the poles of the magnet, a powerful current, whose direction depended on the nature of the pole, was induced in the coil. When the coil retreated from the magnetic pole, a current in the opposite direction was induced. This production of opposite currents by approach and withdrawal has been already referred to in Notes 283, 284.

By means of an instrument called *a commutator*, which reversed one of the induced currents at the proper moment, the opposite currents were caused to flow in the same direction.

The cores of soft iron and their associated coils constitute what is called an *armature*. In Saxton's armature the coils were wound *transversely* to the iron cores.

But, by winding his coils *longitudinally*, or parallel to the axis of the core, and placing the armature so formed between the poles of a series of horseshoe magnets. Siemens obtained magneto-electric currents much more powerful than those of Saxton.

Wilde's Machine.

Things were in this state when, in 1866, Wilde made an important addition to our knowledge of magneto-electricity.

He conducted the current obtained by means of Siemens's armature round an electro-magnet, and found that the magnetism thus excited was far greater than that of the entire series of steel magnets employed to generate the magneto-electric current.

Thus, in one case, he found that, whereas the series of permanent magnets taken collectively was competent to support a weight of 40 lbs. only, the electro-magnet which they excited sustained a weight of 1,088 lbs.

To produce this effect, however, it was necessary that the armature of the magneto-electric machine should rotate with great rapidity.

But Wilde went farther. Forming his electro-magnet from a large plate of iron, and placing between its long poles a correspondingly long armature, similar in shape and construction to that of the magneto-electric machine, he obtained from this second armature currents of enormously greater power than those obtainable from the first.

These currents could, in their turn, be sent round a second electro-magnet, formed from a large plate of iron. Furnished with a rotating armature, this second electro-magnet produced effects previously unknown. Rods of iron a quarter of an inch in thickness were fused by the currents, and they were also found competent, when discharged between carbon terminals, to produce a light of intolerable brilliancy.

Siemens's and Wheatstone's Machine.

The next great step in magneto-electricity was made simultaneously by Dr. Werner Siemens and Sir Charles Wheatstone.

Expressed generally, this discovery consists in exalting, by means of its own action, to a high pitch of intensity an infinitesmal amount of magnetism.

Conceive an electro-magnetic core with a very small amount of residual magnetism, which is never wholly absent when iron has been once magnetized. Let a secondary coil, with cores of soft iron, rotate before the poles of such a magnet. Exceedingly feeble induced currents will circulate in the secondary coil. Let these induced currents, instead of being carried away, be sent round the electro-magnet which produced them; its magnetism will be thereby exalted. It is then in a condition to produce still stronger currents. These also being sent round the magnet, raise its magnetism still higher, a more copious production of induced currents being the consequence. Thus, by a series of interactions between the electro-magnet and the secondary helix, each in turn exalting the other, the electro-magnet is raised from a state of almost perfect neutrality to one of intense magnetization.

When the magnet has been raised to this condition, other coils than those employed to magnetize it may be caused to rotate before, or between, its poles; the currents from these coils may be carried away and made use of for magnetization, for chemical decomposition, or for the electric light.

The first magneto-electric machine used to produce a light sufficiently intense for lighthouses was constructed for Mr. Holmes. In it permanent steel magnets and rotating helices were employed. Mr. Holmes has lately constructed a very powerful machine on the principle of Siemens and Wheatstone.

Induced Currents of the Leyden Battery.

If a Leyden jar, or battery, be discharged through a primary spiral, it evokes a current in a secondary spiral. With a strong charge this secondary current may be caused to deflagrate a foot of thin platinum wire.

If the current from the secondary spiral be led round a third spiral which faces a fourth, on discharging the battery through the primary spiral, the secondary in the third spiral acts the part of a primary, and evokes in the fourth spiral a *tertiary cubrent.*

With another pair of spirals this tertiary current can be made to generate a current of the *fourth order;* this, again, with another pair of spirals, a current of the *fifth order*. All these currents can impart shocks, ignite gunpowder, or deflagrate wires.

For the investigation of the induced currents of the Leyden battery we are indebted to Professor Joseph Henry, Director of the Smithsonian Institution, and to Professor Riess, of Berlin.

◆

ELECTROLITIC INSULATION.

Professor Miller, F. R. S., of King's College, London, thus describes an experimental or model cable on this principle, and some of the results obtained with it, which have not hitherto been published:

"The cable was made in a series of lengths of a yard each. I was informed that each of these lengths consisted of a conducting core of galvanized iron wire one yard two inches in length, coated with a fibrous material—this coated wire was inclosed in a soldered leaden tube one yard in length. The tube was then covered with thin zinc foil, and this in its turn was coated with fibrous material. The whole was then inclosed in a second leaden tube one yard long. Each layer of the fibrous material had been previously steeped in a strong solution of sulphate of magnesia, and allowed to become partially dry by exposure to the air.

"The composite tubes prepared as above described, were laid side by side on an uninsulated wooden table covered with sheet lead (earth). The projecting ends of the galvanized iron cord were connected alternately with the wire adjoining, by means of binding-screws and short pieces of copper wire, so as to make one continuous conducting cable, of 97 yards in length; the three other lengths needed to make up the 100 having been damaged.

"One extremity of this conducting wire was attached to a galvanometer, and through this by means of a commutating key, was permanently connected with the negative pole of a two-cell Daniell's battery, the positive pole of which was connected with the 'earth,' or with the outer surface of the cable through the leaden table.

"The other end of the cable was connected with a series of three resistance coils, consisting of 1,000 yards of fine silk-covered copper wire, 32 gauge; and the other end of these resistance coils was insulated, but could be connected to earth at pleasure by means of a key.

"Every time that this connection of the earth with the galvanometer was made, the needle of the galvanometer was strongly deflected, and signals were transmitted through the resistance coils and cable.

"When thus arranged, the entire cable itself formed a battery of two cells, acting so as to produce a current in the *opposite direction* to that generated by the signaling battery, the electromotive force of which latter somewhat exceeded that of the current which the cable tended to produce, but which it did not actually furnish.

"That this really was the case was shown by reversing the direction of the current from the signaling battery, so as to cause it to *coincide* in direction with that from the cable. The galvanometer was immediately deflected with energy, and the needle thrown against the stop at 90°. The insulation effected by the cable was thus shown to be due to the electrolyte, and not to any interposed dielectric."—*Electric Tel. and Railway Review.*

◆

The Great Northern Telegraph.—The submarine telegraph cable, which is now being laid between Hong Kong and Posiette Bay, may be regarded as an important link in the chain of electrical communication, tending as it does, to bring us in connection with the most distant parts of the British possessions.

Several schemes have from time to time been proposed for the purpose of connecting Europe telegraphically with China, but the route which in every way offered the soundest commercial advantages is that known as "The China and Japan Extension of the Great Northern Telegraph Company," for, in addition to the shortness of its proposed submarine circuits, there exists a complete system of overland communication with England through Russia. These land lines are at the disposal of the company, the Russian Government having undertaken to connect them with the landing point of the cable, and at all times to have a sufficient number of wires available for the traffic.

The cable at present to be laid by this company has a total length of 2,296 nautical miles, in two sections of 1,098 and 1,108 nautical miles respectively. The first section is to be laid from Hong Kong to Wladiwastok (Shanghai). These two parts, which may be looked upon as the centre of European intercourse with China, and in which, consequently, large European trading interests are concerned, will be rendered still more important and attractive from the prospects of that commercial and social development which the electric telegraph invariably effects between trading and social communities.—*Engineering.*

◆

Port Darwin and Port Augusta Telegraph.—The South Australian Government have now a formidable enterprise on hand, nothing short of the establishment of a telegraph line from Port Darwin to Port Augusta. The cost of establishing this line, which will run quite across the Australian continent, is officially estimated at 130,000*l.*—*Engineering.*

◆

The French telegraph and postal departments of the nation have been united. François Frederick Steenackers has been appointed to the superintendency of the new department by the Provisional Government. M. Legoff will be the chief secretary.—*By Telegraph to the N. Y. Herald.*

THE SERVICE.

WESTERN UNION TELEGRAPH COMPANY.

APPOINTMENTS DURING AUGUST, 1870.

T. Carter	145 Broadway, N. Y.
G. Cromwell	145 Broadway N. Y.
Miss M. L. Dubois	145 Broadway, N. Y.
Miss Emil Deusler	Earle's Hotel, N. Y.
James Walker	Sackville, N. B.
James W. Wallace	Iron Mines, N. S.
Geo. M. Jarvis	Point Duchene, N. B.
John H. Tinker	Lewiston, Me.
John H. Wood	Madison, Me.
W. M. Lewis	Alburg Springs, Vt.
Geo. D. Snow	Athol, Mass.
C. S. Atherton	Richmond, Vt.
Frank Marshall	So. Acton, Mass.
L. A. Hill	Townsend Centre, Mass.
M. S. Kenney	Andover, Conn.
J. C. Perkins	Bridgeport, Conn.
George Otis	Newport, R. I.
A. C. Sheldon	Southington, Conn.
J. F. Cleverdin	Stamford, Conn.
Miss J. Jacobs	R. I. Washington, R. I.
F. Purley	Boston, Mass.
W. S. Langdon	Albany, N. Y.
H. J. Spafford	Berlin, N. Y.
H. B. Hagan	Lebanon Springs, N. Y.
Miss J. L. Walton	Irvington.
Miss Anne E. Myers	New Hamburgh.
W. B. Goold	Stephentown.
H. B. Chamberlin	Fulton, N. Y.
C. A. Parsons	Oswego, N. Y.
O. L. Rogers	Utica, N. Y.
B. T. Johnston	Baltimore, Md.
J. W. McLean	Baltimore, Md.
F. J. Weis	Marion, N. J.
W. A. Zinn	Newport, Pa.
Fuel Smiths	Philadelphia.
R. C. Cake	Rahway, N. J.
A. S. Cline	Grafton, Va.
J. H. Baker	Oakland, Md.
Allen Simpson	Weston, Va.

RESIGNED.

Geo. Bascom	5th Avenue Hotel, N. Y.
Miss A. P. Chichester	145 Broadway, N. Y.
F. C. Gray	21 Wall street, N. Y.
A. Mornell	145 Broadway, N. Y.
F. H. Seibert	145 Broadway, N. Y.
W. H. Witte	145 Broadway, N. Y.
Miss L. A. Pitcher	145 Broadway, N. Y.
W. W. Shannon	Corn Exchange
John McLaughlin	Point Duchesne, N. B.
J. Lincoln	Alburg Springs, Vt.
J. H. Cummings	Richmond, Vt.
W. F. Haskins	So. Acton, Mass.
Miss L. T. Hill	Townsend Centre, Mass.
Miss A. M. Bumah	Andover, Conn.
S. D. Williams	Bridgeport, Conn.
D. P. Williams	Southington, Conn.
A. Dan	Stamford, Conn.
Mrs G. W. Anthony	Washington, R. I.
W. H. Garland	Boston, Mass.
F. B Stover	Boston, Mass.
G. H. Prescott	Boston, Mass.
Miss C. Cannon	New Hamburgh, N. Y.
Chas. M. Sabine	Fulton, N. Y.
George Hall	Oswego, N. Y.
Frank King	Tribes Hill, N. Y.
C. H Kelly	Utica, N. Y.
W. H. Graff	Baltimore, Md.
Geo. W. Long	Marion, N. J.
C. H Curtis	Absecom, N. J.
Henry Hastings	Baltimore, Md.
Geo. E. Cromwell	Philadelphia, Pa.
S. B. Whitby	Rahway, N. J.

TRANSFERS.

J. H Berthoff	Erie Line to 145 Broadway, N. Y.
F. E. Blanchard	145 Broadway to WestchesterHouse, N.Y
G. W. Blanchard	Sandy Hook to 5th Ave Hotel, N. Y.
E. J. Bevans	WestchesterHouse to 145 Broadway, N.Y
C. T Goodrich	145 Broadway to Newburgh, N. Y.
Geo. Hall	Oswego, N. Y., to 21 Wall st., N. Y.
C. A. Parsons	21 Wall st. to Oswego, N. Y.
H. Smith	Earle's Hotel to Grand Central House.
Miss C. H. Thayer	145 Broadway to Salem, Mass
James Farish	Norristown, Pa., to Absecom, N. J.
S. R Riddle	Newport, Pa., to Norristown, Pa.
J. T. Wilde	Philadelphia, Pa., to Washington, D. C.
Wm Dyer	Washington, D. C., to Mobile, Ala
Geo. B. Scott	Grafton, Va., to Camden Station, Md.

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ANOTHER important addition made to chemistry since our last meeting is a new, very powerful and very simple form of galvanic battery, discovered, though not yet described, by Bunsen. In this second Bunsen's battery only one liquid, a mixture of sulphuric and chromic acids, and, therefore, no porous cells, are employed. The plates of zinc and carbon can all be lowered at once into the liquid and raised again at will. The electromotive force of this battery is to that of Grove—the most powerful of known forms—as 25 to 18; it evolves no fumes in working, and can be used for a very considerable length of time without serious diminution of the strength of the current, so that Bunsen writes me that no one who has once used the new battery will ever think of again employing the old forms. I had hoped to be able to exhibit to the section this important improvement in our means of producing a strong current, but war has demanded the use of other batteries, and Bunsen has been unable to send me a set of his new cells.—*From Dr. Roscoe's Address before the British Association, London, Sept 15.*

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FAIR OF THE AMERICAN INSTITUTE.

DEAR JOURNAL:

One of the most interesting inventions on exhibition is an alternating battery, invented by Mr. E. D. McCracken of New York, who has already acquired considerable reputation as an electrician. By this invention the electric current is kept continuous and unbroken in consequence of the alternate use of two batteries placed side by side, each of which, in its turn, supplies the fluid necessary for keeping the telegraph apparatus working. The alternation takes place every five minutes, during which time no break whatever is made in the circuit, the poles of one main line battery not leaving their position until those of the fresh main line battery have closed up to the conductor and established a new circuit. A small and very handsome clock is attached to the apparatus, and within this a small local battery regulates a brass switch alternating on a small wheel divided into 12 compartments, 6 of brass and 6 of ivory, over which the switch passes, making 6 closed and 6 broken circuits through the battery every hour. In the apparatus on exhibition there is a resistance of 15 miles of wire in the magnet. The battery is electropoisal, and has now been working night and day for 18 consecutive days under a closed circuit, with but a loss of 8 degrees deflection as attested by the galvanometer. The articles consumed during this time were 4 lbs. of bichromate of potash, 1 cent worth of sulph. acid, and 1½ ozs. of zinc—the total cost of running the 12 cups for 18 days being 12½ cents. The apparatus itself is probably the finest ever manufactured, consisting of key, relay, sounder, register, lightning arrester and switches, all of brass, elegantly plated with nickel. These rest upon a base of hard rubber, very highly polished, the whole being inclosed within a beautiful glass case. Messrs. L. G. Tillotson & Co. are the manufacturers.

Mr. Callahan has on exhibition a couple of his stock printing telegraph instruments, which attract considerable attention, both from the ingenuity of their construction and the simplicity of the arrangement by which this system of telegraphing can be acquired.

Near these instruments are a couple of specimens of Frey's self-closing keys, which have already been favorably noticed by the JOURNAL. Here are also a case of telegraph instruments from the manufactory of Charles Williams & Co., Boston, Mass. These articles are very elegant in appearance, and display very superior workmanship.

Messrs. Pope & Edison have on exhibition a stock printing telegraph instrument something similar in appearance to that of Callahan's. Its peculiarity consists in a polarized switch, by means of which the battery is reversed from one magnet to another without breaking circuit. The clock work used in the Callahan apparatus is dispensed with in this invention.

Electricity is also applied to several new and useful inventions now on exhibition, among which may be mentioned Holmes' magnetic vault and safe protector. By this invention it appears to be impossible to break or open in any way a vault or safe so protected, without an instantaneous alarm being given. The alarm bell can be placed at any distance from the safe with this result.

The Electro-Magnetic Bank Lock Company of Brooklyn, N. Y., also exhibit a patent electro-magnetic arrangement for the protection of locks, differing from the Holmes patent, but apparently answering in every way the purpose for which it is intended. Sternberg's electro-magnetic regulator for regulating the temperature of public buildings, schools, hot-houses, &c., attracts a great deal of attention. The machine is very simple in construction, and can also be adapted for regulating the temperature of liquids undergoing the process of distillation or evaporation. ALIQUIS.

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OIL CITY, PA., October 3, 1870.

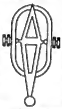
To the Editor of the Journal of the Telegraph:

You are a practical telegrapher, and if the following is in any way incorrect, please toss it under the table.

Errors in our telegraphic machinery is my subject, and I shall by no means exhaust it.

We will make the key our first topic:

The platinum ought to be of the very hardest kind—its density and hardness can be increased by compression. The lever should be double that, as it should divide near the rubber top, and where the trunnion passes through the distance from one side to the other should be two inches, thence to its termination, as now. The shape of the bar or lever would be that of a double cone pointed at each end, and hollow, or a long diamond shape. The immense advantage of this would be no further trouble about the lever getting loose on the trunnion. As the keys are now made, the purchase is too great where the bar crosses the trunnion. There are other ways to attain the same end, and preserve still more the present appearance of our keys. If the bar be cast in the shape of a cross, and the steel trunnion be made to pass through a longer section of the solid bar, still this would not be so good a mechanical job. Many operators write with a heavy side motion, which no key made like the W. U. can stand any length of time. This fault in our keys is an absolute nuisance



Yours, &c., S.

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THE journalistic efforts of the N. Y. *Tribune*, during the occasion of the European war, are positively without an equal in magnitude in the history of newspapers. Every day it has columns of reports from correspondents at the seat of war all telegraphed per cable, and pays therefor often $1,000 in one day. Including the expenses of its correspondents, it must have prepared itself to pay out (besides the cost of telegrams of the Associated Press) at least from $50,000 to $70,000 for special telegrams, even if the war continues only three months. Compared with such enormous efforts of journalistic services, the accomplishments of the London *Times* in the same line dwindle into nothing. It will not be saying too much, when we state that the whole of the newspapers of Germany unitedly do not pay out as much for telegrams as the N. Y. *Tribune* at the present time.—*German paper.*

◆

AUSTRALIAN TELEGRAPHY.—It is interesting to note, in connexion with submarine cables about to be laid off the Australian coast, that it has been ascertained that the bed of the Gulf of Carpentaria is composed of mud in which a cable would bury itself, so that it would be protected from any adverse influences, climatic or otherwise. Submarine routes between Java and Australia are not considered to present any serious difficulties.—*Engineering.*

THE GOVERNMENT STORM SIGNALS.

Some two or more years since we urged the importance of the establishment of a series of storm signals to warn people at a distance of the approach of storms; the information to be conveyed by telegraph to prominent points, and distributed to the surrounding country by means of artillery discharges, striking of church bells, or other means not difficult to devise.

We do not claim to have originated this idea, and have now forgotten who made the suggestion. We saw, however, that it was a good one, and accordingly advocated it.

Our readers have probably most of them been apprised through the dailies that the Government is about to establish a storm signal service.

The corps of observers will be composed of non-commissioned officers in the army, under the direction of the chief of the signal corps, and its duty will be the observation and reporting of storms by telegraph and signals, to prevent loss to commerce upon the great lakes and the seaboard.

So far as this goes it is well, but we hope to see the system extended so as to take in the agricultural districts, at least through the season of harvest. Great loss is often sustained through damage to crops which the farmer is forced to leave out through long storms of rain, when, if duly informed of the approach of such storms, he might easily provide against them.

This system of observation will, however, subserve other important ends besides the saving of life and property on the sea and lakes, and the protection of crops. It will give immense aid in the solution of many important meteorological problems of the highest interest. If the system should be sufficiently extended, the observations may throw great light upon the extent, rate of progress, change of intensity during the progress of storms, and many other interesting matters connected with the theory of storm generation and subsidence.

A similar system has been employed in Europe with great success in warning mariners of danger. In England, especially, it is said these warnings are now so systematically distributed that a very marked decrease of damage has resulted to the marine interests.

Thus the electric telegraph adds to the benefits it has already conferred upon mankind, by giving him notice of approaching dangers in the elements, and enabling him to prepare in good time to avoid them. The fact that the great storms which nearly always come from some point in the west, in this zone, originate in the great plain lying east of the Rocky Mountains has already been quite definitely settled by meteorologists. Traveling at the most rapid rate yet observed, they would be two or more days in reaching the Atlantic coast, while the wires can send the information almost instantly. It needs no argument to convince all intelligent minds that this storm signal service may be one of the most useful established by the Government, provided the appointments be judiciously made, and the duties of the observers be conscientiously executed.

◆

Curious Circuit of Lightning at Valenciennes.—Rev. F. Moigno.—At about 6 p.m. on the 27th of July last, lightning struck, and splintered to match-wood, the mast of a vessel lying in the canal; thence the lightning wended its way to an iron foundery, and, after traversing it for its full length, escaped along the iron stove pipe placed in the office of the foundery; thence it proceeded up the steeple of St. Géry, entering there through a broken glass pane, the room inhabited by the tower watchman. In that room, it (the lightning) fell upon a galvanic battery, employed to convey, by means of electricity, the movements of the clockwork to the town-hall clock, situated at several hundred metres' distance, causing such havoc and disturbance through the connecting wires that it was supposed the lightning had fallen on that building. Leaving the steeple of St. Géry, the lightning first fell on the house of an artist, and, after having broken some panes of glass therein, turned to the clock-tower of the college, melting, without any breakage, several panes of glass, and turning other panes of glass into a mass of curiously-colored non-transparent substance; and, lastly, issuing again near the canal, slightly struck a soldier on duty there, and disappeared in the water. It is clear that, without special knowledge of the topography of the town above-named, it is not well possible to imagine this curious circuit, which, however, represents a broken line, having a basis of an arc of about 45°, and a total length of about 700 metres.—*Chemical News.*

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Chili and Peru Cable Company.—The *Commercio* of Lima, of the 26th of August, publishes the following "Provisional programme" of the Chili and Peru Cable Company, in combination with the Panama and National Telegraph Company of Peru. The object of the Company is to lay a cable, which will unite Chili with Peru, starting from Caldera and touching at the ports of Mexillones, Cobija, Iquique, Arica, Islay, and ending in Pisco. From Pisco the telegrams destined from the the North will be transmitted by the land line of the Peruvian National Telegraph Company, which is in operation as far as Payta. From Payta the telegrams will pass through the cable of the Panama and South Pacific Company to Panama, touching at St. Helena (Ecuador) and Buenaventura (United States of Colombia). The cables will be laid about the beginning of 1871. The Company possesses privileges from the Goverment of Peru and Ecuador, which prevents the establishments of any rival cables between those ports. From Panama to the United States and Europe, communications will be kept up with the cable of the West India and Panama Company, which is actually being laid down to Cuba, and from there by those in operation for years, or by others to be constructed, which may offer better terms. By means of this system, Chili will not only be put in communication with the more northern Republics, but also with the United States and the continents of Europe and North America, but finally with Asia—thus receiving an answer to a question in hours what now takes by letter at least from 80 to 120 days.

◆

Intermittent Electric Lights.—M. Delaurier, of the French Academy of Science, has taken up the proposal of M. Felix Lucas, a Government engineer, to obtain a very powerful electric light for coast service, at a comparatively small cost, by making the light intermittent, with intervals of two seconds; by this means, it is said, one ten-thousandth part of the electricity expended for a constant light will suffice. M. Lucas proposed to use static, but M. Delaurier prefers dynamic, and especially induced electricity, and suggests the following arrangement: A battery which is only in action when the circuit is open, the couples united together in masses, and the electricity passed through coils of solid iron wire; a very long copper wire, covered with silk, is wound around the iron wire-coil, the copper being sufficiently thick not to be heated by the passage of the current. Each pole is provided with a charcoal point; when these are in contact the current passes, and when they are separated the sparks are excessively brilliant, because both the direct and the extra current are brought into action, resulting from the induction of the current on itself and that by the coil of iron wire. The charcoal points are favorable to a spark of short duration. A very simple arrangement of clockwork causes the points to come into contact every two seconds, and then separates them sharply, so as to break the current instantaneously. It is not possible to obtain by these means a flash of such short duration as with static electricity, because the current passes for an instant through the air when the charcoal points are separated. It is believed that this system will be found useful, not only for piercing fogs at sea, but also for railway signals.

◆

Guiding Vessels by Electricity.—Mr. J. A. Ballard, hailing from Bombay, India, proposes to apply electricity to the purpose of maneuvering vessels, but more especially to torpedo boats or rams, from a distance, so that the operator may be able to bring such vessels into the proximity of an enemy, but not himself be injured by the explosion or concussion. The torpedo-boats would be movable by steam, compressed air, or similar methods. He proposes that the person guiding the vessel should send electric currents to it either through a telegraph submarine cable or suspended wires, and that these currents should magnetize the cores of electro-magnets on board, and he proposes to apply the powder, obtained by alternately magnetizing and demagnetizing the cores of the magnets, to the purpose of opening and shutting steam-valves, and of putting machinery into and out of gearing, and generally of doing such work as is necessary for guiding and maneuvering the vessel.

◆

Allemagoozelum, Pa.,
(3 miles from Pithole), Oct. 3, 1870.

To the Editor of the Journal of the Telegraph.

Mr. Editor: I do dislike to hurt anybody's feelings, but, in order to save three thousand or more the useless experiment which that Santa Fé man claims to have tried with such success, I will state that the escape must have gotten off his wire while he was putting the forward-action spring on his relay armature. The idea is perfectly ludicrous—if the relay is not perfectly self-adjusting, so there is perfection about it any way, which is very consoling. For every grain of force used to pull the armature forward, in addition to the force of the magnet, a grain must be added to pull the armature back; so, if he should put the full strength of a buggy spring on the forward motion, he would straightway have to put a buggy spring on the other side, while the original spring would still do the entire work, while he would get "his own writing" as thin as ever. If this is not plain enough, let him try this the next time it rains hard. Get the adjustment for the other end office—then put on a spring pulling forward. All right; now, don't change the first spring, but tell the man at the other end to "*go*" lively. Then imagine Santa Fé reach for his adjusting post—but he's too late, he has lost the date, address, and a a word or two.

You are a nice editor to publish a telegraphic journal. Just think of the swearing that must have been done already on your account and that man's account at Santa Fé.

Yours,
Knowlett Up.

◆

We would be glad if parties sending us marriage notices would do so by letter, signing the name in full and writing the notice so plain as to avoid error. As a general thing, no writing reaches us on any topic more slovenly in appearance or of more undefinable chirography than marriage notices.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, OCTOBER 15, 1870.

THE ANNUAL ELECTION.

The annual election of Directors, to constitute the Board of the Western Union Telegraph Company for the ensuing year, was held at the office of the Company, 145 Broadway, N. Y., October 12, at noon. There was a spirited representation of stockholders, and votes were cast upon $27,942,200 of the capital stock. Professor Morse presided. The President and Treasurer presented their reports, which were both received and ordered filed. Some telling facts connected with the operations of the past year and their auspicious bearing upon the future of the Company, brought out marked tokens of approbation. The President's report will be printed.

The election, which was without opposition, resulted as follows:

Board of Directors.

Hugh Allan, Montreal,
James H. Banker, N. York,
Roswell S. Burrows, Albion, N. Y.
Horace F. Clark, N. York,
Emory Cobb, Kankakee, Ill.,
Alonzo B. Cornell, N. Y.,
Ezra Cornell, Ithaca, N. Y.,
Harrison Durkee, N. Y.,
William E. Dodge, N. Y.,
J. Alder Ellis, Chicago, Ill.,
Norvin Green, Louisville, Ky.,
Augustus W. Greenleaf, N. York,
John A. Griswold, Troy, N. York,
James H. Howe, Kenosha, Wis.,
Wilson G. Hunt, N. York,
George Jones, N. York,
Cambridge Livingston, N. York,
Edwin D. Morgan, N. Y.,
William Orton, N. Y.,
Edwards S. Sanford, N. Y,
Augustus Schell, N. Y.,
Hiram Sibley, Rochester, N. Y.,
Zalmon G. Simmons, Kenosha, Wis.,
John Steward, N. Y.,
Moses Taylor, N. Y.,
Daniel Torrance, N. Y.,
George Walker, Springfield, Mass.,
Edward B. Wesley, N. Y.,
Stillman Witt, Cleveland.

Inspectors of Election.

James D. Reid, Richard A. McCurdy,
George Wales Soren.

At the close of the annual meeting Mr. Orton arose and begged the courtesy of being allowed to say a word before adjournment. This being accorded, he remarked somewhat as follows:

Gentlemen: I cannot but regard it as a circumstance of peculiar interest connected with this day's proceedings, that at the head of this table, and presiding over this body, sits our venerable friend, Professor Morse, the father of all the telegraphs. In the same presence sit to-day, participating in the annual services of the largest telegraphic organization of the world, the man who made its existence possible, and the men who made it. It seems a deeply interesting fact that from the brain of a single man who yet mingles with us thus so unassumingly, and who, though crowned with the honored hoar of nigh eighty years, is yet clear of eye and firm of foot, there sprang a design which has given a language, and a literature, and a means of instant audience with the world. It is significant, also, of that design that it is so simple as to be elementary, and so complete as to have challenged, unimproved, the acceptance of the world. I therefore, for myself, and I think for you, also, gentlemen, desire to offer to our illustrious Chairman the warmest congratulations on the auspicious development of the art to which he gave birth, and to desire for him all that may render his ripened years as happy as they are honored.

A resolution expressive of thanks to him for presiding at the meeting, and in the spirit of Mr. Orton's remarks, having been passed, Prof. Morse, deeply affected, and without rising, thanked the gentlemen present for the kind words used respecting him, and for which he said he had no suitable language to express his gratitude.

The meeting then adjourned.

At a meeting held October 13, by the newly constituted Board, the following officers were elected:

William Orton, *President.*

Executive Committee.

William Orton,
Horace F. Clark,
John Steward,
E. B. Wesley,
E. D. Morgan,
James H. Banker,
A. B. Cornell,
Augustus Schell,
A. W. Greenleaf,
Z. G. Simmons,
Harrison Durkee.

The following statement exhibits the operations of the Company during the past as compared with the year previous:

On the 1st of July, 1870, this Company possessed 54,109 miles of poles, and 112,191 miles of wire, against 52,099 miles of poles and 104,584 miles of wire at the same time last year; being an increase of 1,910 miles of poles and 7,607 miles of wire.

During the past year there has been an increase of 581 offices and 983 sets of telegraphic apparatus.

The gross receipts for the year ending July 1, 1869, were	$7,316,918
Do. 1870	7,138,737
Decrease	$178,181
or 2½ per cent.	
The gross expenditures for the year ending July 1, 1870, were	$4,910,772
Do. 1869	4,568,116
Increase	$342,656
or 7½ per cent.	

The number of messages transmitted during the year was twenty-two per cent. more than for the preceding year.

The net profits for the year ending July 1, 1869, were	$2,801,457
Do. for 1870	2,227,966
Being a decrease of	$573,491
or 20 per cent.	

From October 1, 1869, when the reduced tariff went into operation, to April 30, 1870, the gross receipts were $233,273 less and the expenditures were $186,019 more than for the same months of the preceding year, making a difference in the net earnings of $119,293. Thus seventy-four per cent of the decrease in the net earnings for the year occurred in the first seven months after the reduction in the tolls. Of this decrease in the net earnings $300,322 occurred during the months of January and February alone, being thirty-five per cent. out of the decrease for the year. After the reduction of the rates in October of last year, the gross receipts did not come up to those of any corresponding month in the preceding year until May, when they exceeded the same month of the preceding year by $7,755. In July, 1870, the receipts exceeded the same month in 1869 by $36,399. In August, 1870, the receipts exceeded the same month of the preceding year by $41,194.

As the cost of performing an increased amount of traffic increases in a certain proportion with the service, the net earnings did not come up to the amount earned in any corresponding month of the preceding year until July, when they were in excess of the same month for 1869 by $21,281.

In August, 1870, the net earnings were $218,614, being $14,087 better than in 1869.

From October 1, 1869, when the rates were reduced, to March 1, 1870—five months—the net earnings were $847,879.

From March 1, 1870, to August 1, 1870, five months, the net earnings were $946,862, being an increase of $98,983, or eleven six-tenths per cent. If the same rate of increase should continue for the next year the net earnings would amount to $2,186,800, which, added to the amounts saved by the abolishment of the national tax, would make the net earnings for the year ending July, 1871, $2,696,400. We may, however, expect much better results than these, for the business for the five months from October 1 to March 1 is generally better than the five months from March 1 to August 1.

Thus, from October 1, 1868, to March 1, 1869, the net earnings were $1,207,564, and from March 1, 1869, to August 1, 1869, $1,032,124, showing that the autumn and winter months for 1868 and 1869 were $175,440 better than the spring and summer months of 1869, while for the present year the spring and summer months are $98,953 better than the preceding autumn and winter months.

The average rate of tolls upon the entire volume of business done for the year ending July 1, 1870, was twenty per cent less than for the year ending July 1, 1869.

The average expense of transmission per message for the year ending July 1, 1870, was 11 2-10 per cent less than for the year ending July 1, 1869.

THE TEMPER OF CRITICISM.

The first response we have to our polite invitation for free and frank correspondence is one from a very undefined place, although from a familiar hand. It ridicules the double spring arrangement at Santa Fe, and seems inclined to pillory us as the cause of much imaginary profanity by appearing to countenance the new Mexican suggestion. Now it is never best nor wisest to laugh at what, in the experience of an intelligent man, seems folly. The experience of a non-expert is better to him than all the theory in the world, and the laugh of a critic is more likely to prove to him the critic's folly than his own. This same double spring action, we believe, was the subject of a patent by one of our best mechanicians, and long before any patent was dreamed of, we unconsciously used it in the simplest possible way as a pure necessity, when, twenty-five years ago, we toiled through the long nights receiving the Mexican war news. Of course we were very ignorant, and the line south from Philadelphia was poorly insulated. We, no doubt, suffered from both causes. But many a long night have we sat with the palm of our forefinger pressed gently against the armature to secure a delicacy of movement by which we could receive the reports, that we could in no other way obtain. The pressure of the palm of the finger was the equivalent of this same return spring, and its action seemed to be in the modifying of the rigidity of the ordinary retaining spring, and in aiding the available magnetism at its point of greatest tenuity by placing the armature within its grasp. This is the recollection of the thought of a non-expert a quarter of a century ago. It may be laughable now when exposed to the refinement of crucial theory, yet, when it is resorted to from whatever cause, we recognize some one passing through our old experience, and shake hands with him. Now the duty of an expert is to show the error of a method, and, if possible, provide a better. Almost every operator is ignorant of the subtle calculations by which the electro motive forces are graded and stated, or even of the principles underlying general mechanics. It is for the few who have compassed these subtleties to guide their less fortunate allies, and, by simple methods of statement and illustration, to increase the general knowledge. To laugh at honest ignorance is to give ignorance immortality.

◆

General Chauvin, the Director of the Prussian Government Telegraphs, has just arrived at Hagenau. He will be followed by 900 Prussian telegraphists. So says the correspondent of the London *Daily News*. This looks very much like occupying France.

◆

Mr Samuel J. Smith, Jr., for the last ten years connected with the Auditor's Department of the American and Western Union Telegraph Companies, has resigned, and leaves immediately to enter into business in one of the new towns just springing into existence in Southern Kansas. He carries with him the well wishes of all his old associates, as well as of the officers of the company whom he has served so faithfully. We are sorry to lose him, and desire for him abundant success.

◆

Mr. W. F. Archibald of the Buffalo office of the Western Union Telegraph Co., left, October 8, on the City of Paris, for a winter's furlough in Great Britain. He entered the service many years ago under our superintendency, and has always proved himself a most worthy and faithful man. We hope he will return in thoroughly established health.

WESTERN UNION TELEGRAPH COMPANY.

OFFICIAL STATEMENT.

	August.	
	1869.	1870.
Receipts	$612,517 47	$653,641 85
Expenses	407,990 89	435,027 71
Net profit	$204,526 58	$218,614 14

◆

EXECUTIVE ORDER No. 108.

On the back of all Monthly Report (Office Account Current) Blanks now and hereafter distributed will be found the following terms:

CLASSIFICATION OF TELEGRAPH RECEIPTS.

Press Despatches		
Half Rate Messages		
Full " "		
Total Telegraph Receipts, as per Account Current		

NUMBER OF MESSAGES SENT AND RECEIVED.

Sent Paid	Full Rate	No.	
" "	Half "	"	
Sent Collect	Full Rate	"	
" "	Half "	"	
Received Paid	Full Rate	"	
" "	Half "	"	
Received Collect	Full Rate	"	
" "	Half "	"	
Sent	D. H.	"	
Received	D. H.	"	

Office Messages and local R. R. Messages entitled to be sent free between points on the line of road are not to be included in this Report.

Managers will fill up these forms for the month of October and thereafter.

Where supply of old blanks is still on hand, write these forms on the back.

All reports hereafter received without the statistics herein called for, will be returned for correction.

WILLIAM ORTON, President.

◆

There is no better indication of growing intelligence than the demand for books and the sources of instruction. The same may be said of art, as its work becomes more widely demanded, and the tools by which it is perfected are multiplied. We notice therefore with pleasure, not as a puff for the makers, but because of the existence of the demand which compels the manufacture, that the finer class of examining electrical machinery by which the faults and resistances of telegraph conductors are detected, are being provided at rates so cheap as to induce their more extensive use as well as to meet an actual demand. Hitherto these have had to be procured in England or France, where they are made with great delicacy and with a fineness of finish which made them desirable even at high rates. Gray and Barton, of Chicago, have not only succeeded in executing work equal to the foreign article, but in providing galvanometers, rheostats, and other electrical measures, at prices far lower than that at which they can be imported. For this they deserve the thanks of all electricians. We shall soon see every division of the telegraph lines watched by these sharp-eyed detectives of frauds upon the electric currents of the wires, and the lines kept so clean as to render the labor of the operator less arduous, and his work more certain.

ANSWERS TO CORRESPONDENTS.

Is it the intention of Rule 14 to allow messages destined or points on other lines to be sent at half rate for this line, and full rate for other lines, provided such messages are not delivered to other lines until the next morning? For instance: Is it proper for us to take a message for Port Sarnia, Ontario, collecting half rate for "this line" to Detroit, and full rate for Canada line? We have heretofore sent messages in that way, and have also received such messages from offices on "this line" to go beyond here by other line, delivering to "other line" next morning. Exception is now taken to our practice. Half rate messages frequently come to be mailed; those we mail next morning. How far have we been incorrect?

Rule 14 reads as follows: "Messages to be transmitted at half rates will be received for all *stations on our lines* in the United States, east of the Mississippi River, including St. Louis. *Half rate messages will not be received for transmission from any other telegraph line.* Executive Order No. 104 extended the half rate system to St. Joseph, Lexington, Kansas City, La Grange, and Canton, Missouri; Atchison, Leavenworth, and Lawrence, Kansas; Omaha, Nebraska; Keokuk, Davenport, Fort Madison, Burlington, Muscatine, Clinton, Dubuque, Des Moines, Iowa City, Council Bluffs, Iowa; and Evansville, Indiana."

In the JOURNAL OF THE TELEGRAPH of May 2, 1870, a correspondent asks if half rate messages can be received at Western Union offices for places on another line by the payment of half rates for this line and full rates for connecting line, to which we replied as follows: "*No. Messages to be transmitted at half rates will be received only for stations on our lines. Half rate messages will not be received for transmission from, nor for, any other telegraph line without special arrangement, of which due notice shall be given.*"

We do not see how we can state in plainer language than the above, that *we do not transmit half rate messages over any portion of our lines for stations on other lines, without special arrangement, nor do we receive messages from any other line for transmission over our lines at half rates, except by special arrangement. The transmission of dispatches at half rates is strictly confined to messages which originate and terminate at Western Union Telegraph offices, unless where a special arrangement has been made with some connecting line, of which notice has been given.*

The correspondent who sends us the above will perceive that he has acted contrary to the rule, and contrary to the explanation in the JOURNAL respecting half rate messages, both in transmitting messages at half rates for, or receiving them from, stations on other lines, without having received special notice that such stations were included in the Half Rate Arrangement.

The following message was recently sent over the line:

> "Hiert A Bay Hors fifetin Hans by Short Main and Tail Blind in Lef Eye leter C. S. on left sholder Hiert to a man by the naim of Stevens on monday to be Returnt on Tuesday no Returnt yet. ceep a A Lok out for Hym and dhespatch to Creencastel and Shampersburg to sum cood man and I will pay you for it."

The question arises would a receiving operator be compelled to receive such a message verbatim, providing the sending operator chose to send it that way? And would the sender leave himself liable to censure were he to correct the orthography before sending? In short, have we the power to correct obvious bad spelling?

After a dispatch has been accepted by an employé of the Company, and its transmission paid for, it cannot be altered in any respect by the transmitting or receiving operator; but must be sent and delivered to the person addressed precisely as written, without any change whatever. If a dispatch, however, is handed to the receiving clerk containing obvious mistakes in spelling, occasioned by the ignorance of the person who offers it, it would be very proper for the clerk, and obviously his duty, to courteously point out such errors in orthography, and offer to correct them.

MORSE TESTIMONIAL FUND.

RECEIVED SINCE LAST ISSUE.

Governor Bullock of Georgia, and Governor Jewell of Connecticut, are old telegraphists, and have done good service on the wires. The former sends us good cheer, as follows:

EXECUTIVE DEPARTMENT, STATE OF GEORGIA,
ATLANTA, GA., Oct. 6th, 1870.

J. D. REID, *Chairman, &c.*

DEAR SIR: Yours 29th Sept., inclosing prospectus Morse Monumental Fund, received.

I hope the effort will prove a perfect success, and inclose my check for $100. If an additional hundred should be necessary to secure the completion of the statue, you can draw on me for it.

Yours fraternally,

RUFUS B. BULLOCK.

Rufus B. Bullock, Governor of Georgia	$100 00
David Brooks, Philadelphia, Pa	25 00
O. H. Palmer, Treasurer, New York	25 00
Gamewell & Co., Fire Alarm Works, New York	20 00
John M. McCauley, messenger, Fredericksburg, Va.	50
John McKernan, student, Corunna, Mich	25
William Goodall, Horsetown, Cal	1 00
E. Beamer, repairer, Lafayette, Ind	1 00
E. P. Adams, Mont. Tel. Co., Gorham, N. H.	1 00
James Farish, R. R. agt. and mangr W. U. T., Absecar, N. J.	1 00
S. D. Lawson, manager, Father Point, Canada	2 25
William R. Fisher, Trinidad, Colorado	1 00

IOWA.

DUBUQUE, IOWA, Sept. 26, 1870.

DEAR SIR: Herewith you will find our lists. I am glad to see many Iowa names through other sources. I shall hope to add to mine until the fund is complete. I inclose also $15 for names reported by Mr. Bliss. Yours, very truly,

R. S. FOWLER.

R. S. Fowler, supt., Dubuque	$5 00
E. P. Lyman, chief operator, Dubuque	2 50
Ed. Sholes, operator, Dubuque	2 00
Miss J. J. Wirt, operator, Dubuque	1 50
W. J. Lloyd, operator, Dubuque	1 00
Frank McLaughlin, operator, Dubuque	1 00
Charles Jennings, messenger, Dubuque	1 00
A. W. Bedell, operator, Peosta	1 00
F. E. Munger, operator, Farley	1 00
G. B. Mathews, operator, Farley	1 00
W. E. Talmage, operator, Floyd	1 00
E. Steever, operator, Anamosa	1 00
H. A. Olmsted, operator, Raymond	1 00
W. J. Nash, operator, Monticello	1 00
H. W. Olmsted, operator, Sand Spring	1 00
T. Faugh, operator, Osage	1 00
W. T. Nicholson, operator, Delaware	1 00
M. G. Hull, operator, Marion	1 00
H. R. Paul, operator, Janesville	1 00
E. H. Bush, operator, Worthington	1 00
S. J. M. Bear, operator, St. Ansgar	1 00
J. D. Harker, operator, Nashua	1 00
Miss Mary Gray, operator, Dubuque	2 00
T. E. Clark, foreman repairs, Dubuque	1 00

COUNCIL BLUFFS.

J. W. Morse, manager, Council Bluffs	$1 00
E. A. Street, operator, Council Bluffs	1 00
E. K. Bailey, operator, Council Bluffs	1 00
E. E. Harbert, manager G. West. Tel. Co., Council Bluffs	1 00
William L. Aton, R. R. operator, Council Bluffs	1 00
J. G. Bloss, " "	1 00
M. A. Smith, " "	1 00
T. S. Hines, " "	1 00
J. W. Strong, " "	1 00
*W. B. Strong, gen'l agent C. & N. W. R. R.	1 00
*H. C. Nutt, supt. Mo. River Transfer Co.	1 00
*W. H. Parker, agent C. R. I. & P. R. R. Co.	1 00
E. J. C. Berry, Sand Prairie, Iowa	1 00
A. L. Leonard, Woodville, Iowa	1 00
George B. Leonard, Independent, Iowa	1 00
A. C. Van Gilder, Ottumwa, Iowa	1 00
H. A. Kinnaman, Keokuk, Iowa	1 00
J. C. Dorchester, Keokuk, Iowa	1 00
James Jennings, Waukee, Iowa	1 00
Credited previously $15.	$51 00

* Formerly operators.

TEXAS AGAIN.

GALVESTON, TEXAS.

DEAR SIR: Please find inclosed $16 50, subscriptions to Morse Testimonial Fund by the following parties.

Truly yours,

L. E. CURTIS.

N. J. Petrick, manager, San Antonio	$1 50
H. Nolte, repairer, San Antonio	1 50
A. Mersfelder, manager, Huntsville	1 00
John H. Lee, manager, Bryan	2 00
M. Cohen, operator, Allen Station	1 00

GALVESTON.

L. E. Curtis, mgr	$5 00	William Keohler, messgr.	50
D. C. Bleakney	1 00	A. Russell	50
J. H. Whitaker	1 00	William Mather	50
W. J. Hancock, jr	1 00		
			$16 50

CINCINNATI AND ZANESVILLE R. R. TEL.

S. C. Abbott, Depot, Zanesville, O	$1 00
T. E. Pemberton, Roseville, O	1 00
G. F. Gardner, New Lexington, O	1 00
G. W. Gardner, Bremen, O	1 00
A. Y Barks, Lancaster, O	1 00
J. E Blasse, Depot, Lancaster, O	1 00
L. W. Boyer, Depot, Circleville, O	1 00
C. H. Sanderman, Depot, Amanda, O	1 00
George Viereborne, New Holland, O	1 00
J. C. Hatcher, Washington, Fay Co., O	1 00
G. H. Ely, Sabina, O	1 00
L. D. Hinman, Wilmington, O	1 00
	*$12 00

SCIOTO VALLEY LINE.

Robert N. Norton, Catlettsburg, Ky	$1 00
Frank P. Kehrer, Ashland, Ky	1 00
J. J. Hoke, Ironton, O	1 00
J. H. Towns, Portsmouth, O	2 00
L. J. Towns, messenger, Portsmouth, O	50
U. J. Darst, Circleville, O	1 00
M. Van Heyde, Circleville, O	1 00
J. H. Miller, Circleville, O	50
B. F. Curl messenger, Circleville, O	50
S. Monypeny, Lockbourne, O	50
	*$9 50

* These we receive from Mr. Samuel Ward, manager, Circleville, O., whose own subscription we received and acknowledged in July. To some of the above this is the second subscription.

FORT WAYNE, MUNCIE AND CINCINNATI RAILROADS.

DEAR SIR: Inclosed find $20 for the Morse Testimonial. Every contribution is accompanied with hearty wishes for the success of the good work. Hope to add more soon. We are opening up a new line.

Truly yours,
O. M. SHEPARD, Supt.

J. A. Larned	$1 00	J. W. Fontz	$1 00
D. R. Bonnell	1 00	J. W. I. Smith	1 00
E. J. Richardson	1 00	C. Q. Smith	1 00
D L. Shumway	1 00	J. Smith	50
P. Hughes	1 00	C. E. Beaver	50
S. M. Ochiltree	1 00	J. C. Gilmore	1 00
C. H Stevens	1 00	Sam Campbell	1 00
Thomas O'Neil	1 00	J. N. Davis	1 00
E C. Phelps	1 00	William Lee	1 00
J. Curtis	1 00	O. M. Shepard	1 00
Geo. Winter	1 00		
			$20 00

MISSOURI AND KANSAS ONCE MORE.

E. O. Pickering, St. Louis, Mo	$1 00
James W. Cook, St. Louis, Mo	1 00
Kit Dougherty, St. Louis, Mo	1 00
Henry Stanbery, St. Louis, Mo	1 00
A. Z Stephenson, St. Louis, Mo	1 00
William D. West, St. Louis, Mo	1 00
J. A. Hard, Lawrence, Ks	1 00
E Everts, Lawrence, Ks	1 00
H. A. Wood, Lawrence, Ks	1 00
F. M. Abbott Ottawa, Ks	1 00
Leon G Mitchell, Garnett, Ks	1 00
Jo. Hansen, Menwaka, Ks	1 00
G. N. Lawrence, Waterville, Ks	1 00
Jennie F. Twiss, Topeka, Ks	1 00
Kittie Littlejohn, Topeka, Ks	1 00
Frank P. Arbuckle, Jerome, Mo	1 00
P. P. Arbuckle, Jr, Jerome, Mo	1 00
R. Q. Brown, Jefferson City, Mo	1 00
A. Fulkerson, Jr., Jefferson City, Mo	1 00
M. M. Gum-aulius, Jefferson City, Mo	1 00
D. E. Mortyn, Leavenworth, Ks	1 00
	$20 00

EAST PENNSYLVANIA RAILROAD.

ALLENTOWN, Pa., October 1, 1870.

DEAR SIR: Accept the following, with our best wishes. Every little helps.

THOS. H. HAGENBUCH.

G. W. Harrison, Reading, Pa	$ 50
R. D. Darlington, Temple Pa	50
W. H. Schantz, Blandon, Pa	50
Victor Roult, Blandon, Pa	50
E. F. Holder, Lyons, Pa	50
C. B. Mebt, Lyons, Pa	50
A. A. Buckwalter, Lyons, Pa	50
L. A Bower, Topton, Pa	50
J. H. Miller, Topton, Pa	50
J. P. Hartman, Alburtis, Pa	50
L. K Hannum, Alburtis, Pa	50
J. J. Kemmerer, Alburtis, Pa	50
E. J. Hirshberger, Alburtis, Pa	50
W. M. Weaver, Alburtis, Pa	50
J. W. Weaver, Alburtis Pa	50
T. W. Moyer, Emmaus, Pa	1 00
J. L. Lindell Emmaus, Pa	1 00
T. H. Hagenbuch, Allentown, Pa	1 00
R. R. Adams, Allentown, Pa	50
	$11 00

WASHINGTON TERRITORY.

J. W. Wright, manager, Payallup This is Mr. Wright's second subscription.	$1 00
J. W. Wright, chief operator. Must be the same man	1 00
J Washington Wright, repairer. Once more and fourthly	75
James Wright. Fifth and last time. (Total, $4 25.)	25
	$3 00

MASSACHUSSETTS.

F. L. Manley, Chester, Mass	$1 00
B. F. Pierce, Marblehead, Mass	1 00
Amelia Snow, Orleans, Mass	1 00
A. P. Jones, Ashland, Mass	1 00

REPAIR FORCE OF THE SIXTH DISTRICT, E. D.

DEAR SIR: Here are the subscriptions of my men and self, all glad to have a hand in the good work.

GEO. C. THOMPSON.

Geo. C. Thompson	$2 00	John McDonald	$1 50
D. B. Taylor	1 50	J. Ayers	1 50
C. Thompson	1 00	D. Edwards	2 00
Griff. Owen	1 50	W. Walrath	1 50
S. T. Davidson	1 50	W. C. Smith	1 50
James Parker	1 50	John Hanson	50
John Fritts	1 50		
			$19 50

Richard E. Reddick, manager, Enfield, N. C	$1 00
Charles E. Foster, Mount Carroll, Ill	1 00

WOODVILLE, MISS.

W. W. Chisholm, manager	$1 50
L. Chisholm, assistant operator	1 00
Daniel Cohen, ex-operator	1 50

BAYOU SARA, LA.

Edward Whiteman, manager	$1 00
John D. Austin, ex-operator	1 00

NORTHUMBERLAND, PA.

A. C. Jones, manager W. U. Tel	$1 00
Will. A. Irwin, operator P and E. R. R.	1 00
James McGinn, repairman	1 00
Miss Hattie W. Wenck, operator P. and E. R. R.	50

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TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

ANNUAL MEETING.

DEATH OF WILLIAM P. JANES—ASSESSMENT NO. 15.

We regret to have to announce another death among our membership. The following dispatch reached us on the date it bears:

COLUMBUS, Ga., Oct. 2.

JAS. D. REID, *Esq., Treasurer Telegraphers' Insurance Association, N. Y.*

I regret to announce the death by bilious fever of William P. Jones, operator at Evergreen, Alabama, which took place this morning at 5 o'clock, after a short sickness. He has been in the employ of the Company for ten years—a good and faithful man. He was a member of our Insurance Association.

C. G. MERIWETHER, Sup't.

This death will probably be the last we shall have to record before the close of the third year of the existence of the Association, which expires with the present month. Five deaths per annum will have, therefore, been the mortality among our membership, or a little more than one-half per cent. per annum on the recorded membership, which now numbers 980. This is a very low average.

We are sorry to report, however, that, although the number of members is thus large, the committee have been compelled to drop 152 from the records for default. A number of applicants seem to have thought that the initiatory fee of a dollar and a half was all for which they would ever be called upon to pay. Others have removed, and notices of assessments, no doubt, fail to find them. Some have gone into other pursuits, and regard their rights as having ceased, and so make no remittance. Others still have either become poor or have tired answering so many calls. No one has been dropped who did not owe at least two assessments. Official notice has been sent them, so that, in case of death in that class, they may understand what our duty is in such a case. In this necessity of erasing defaulters, however, we are not alone. The Railroad Life Association have, in the same period, erased the names of 540 out of 3,800 members, and 138 have withdrawn. The voluntary withdrawals of which we have been notified number about 20; deaths, 15.

We are obliged now to issue a call for assessment No. 15, and to notify you that the annual meeting of the Association will be held in New York, at 145 Broadway, Nov. 1, 5½ P. M.

ASSESSMENT NO. 14.

Warren H. Moake,
W. H Chivvis,
W. Blanchard, 13 & 14.
J. W. Kelly,
W. H. Bancroft,
J. C. Henry,
H. V. Russell,
G. W. Robinson,
F. T. Smith,
N. H. Brown,
J. W. O'Brien,
B. A. Fryor,
R. J. Beaumont,
P. Dugan,
M. L. Smith,
W. W. Shock, 13 & 14.
S. D. Jaynes,
P. Schafer,
D. H. Ogden,
T. J. Laudy, 13
G. K. Walcott,
C. E. Tweed,
C. Brown,
J. V. Brisbin,
J. A. Fuller,
J. A Hasty,
W. H. Hamlin,
J. N Hoover,
C. Minger,
R. A. Taylor,
J. E. Thomas,
W. S. Mead,
W. H. Vandegrift,
A. Winder,
J. C. Wilson,
C. C. Whitney,
W. Patterson,
H. H. Williams,
W. H. Boyd,
L. R. Freeman,
W. H. Weller,
T. D. Gibbons.

ASSESSMENT NO. 15.

J. D. Reid,
Robert B. Welch,
D. J. Willis,
Andrew Smith,
Alvah B. Waite,
W. Wallace Shock,
R. C. Humphreys,
E. R. Brundage,
Geo. O. Smith,
J Herrick,
W. H. Fessenden,
Thomas M. Bryan,
E. Tullis,
Geo. Edgar Netherland,
G. D. Phillips,
Ira De Witt,
John Campbell,
Martin Barth,
C. J. Depew,
William Spiener,
Mrs. Ann E. Brown,
G. A Todd,
Libby Fryer,
T. M. T. Weller,
John C. Henry,
C. W. Terrell,
G. M. Dugan,
John H. Hoffman,
James W. O'Brien,
H. O. Crowley.

REPORT.

Total certificates issued to October 10th		987
Dead	15	
Resigned	20	
Excluded	152	187
Membership, October 10th		800
Liable to assessment on No. 14, exclusive of dead, resigned and excluded,		737
Delinquents October 10th, on No. 14	159	
No. 14 Assessment, paid	578	
		737

◆

A TELEGRAPHIC BADGE.—In an advertisement elsewhere will be found notice of the manufacture by Messrs. Harvey & Dow, St. Johnsbury, Vt., of a gold pin in the form of a telegraphic key, suitable for either the shirt or vest. It strikes us as an unusually elegant article of jewelry, and forming a neat and appropriate badge significant of membership with the craft. To the success of everything which tends to fraternity and mutual recognition among telegraphic laborers we give our hand, and we shall be glad to see the key pin before long glistening on the immaculate white of many a shirt bosom.

◆

OCCASIONALLY in our columns have appeared brief, polished, epigramatic lines of poetry by Henry C. Cooper, once on a time a knight of the key, but now engaged in more prosaic pursuits. Mr. Cooper still, however, woos the muses, and has laid on our desk a very beautifully executed volume of poetry bearing his name, and entitled "*Thoughts in Verse.*" The twenty-four poems of which the volume is composed are of a meditative, plaintive character, very pure, very reverend, and indicative of a refined and elevated taste, and arranged as sacred, secular, and masonic. We can discover no attempt in these poems at anything beyond what the title indicates, the modesty of which corresponds with the unambitious yet elegant and elevated character of its contents.

◆

MARRIED.

HINSDALE—HOLMES.—At the residence of the bride's father, Cleveland, O., Sept. 27th, by the Rev. Samuel Wolcott, D. D., Mr. Daniel C. Hinsdale, of Indianapolis, to Miss Jennie Holmes, of Cleveland.

Mr. Hinsdale is the Assistant Chief in the Western Union Operating Room in this city—a gentleman and a friend to the newspaper fraternity in seeing that good "copy" is furnished us. We trust he will have no more reason to complain of himself on that score than we have. Here's Rip's toast to him and his bride.—*Indianapolis Journal.*

ZIEGLER—MCREYNOLDS.—Harrisburg, Pa., Thursday morning, October 13, at 11 o'clock, Richard B. Ziegler to Miss Sally J. McReynolds, both of Harrisburg.

FRY—BRANDT.—At Columbia, Pa., Sept. 14, by the Rev. Mr. Rhodes, R. J. Fry, Manager Western Union Telegraph Office, Altoona, Pa., to Miss Kate Brandt, of Columbia.

◆

DIED.

BURNETT—On the 17th inst., of Typhoid Fever, J. T. Burnett, of Camp Point, 27 years of age.

Mr. Burnett came to this place about seven years ago and has ever since resided here, being employed as Telegraph Operator and Express Agent, in both of which positions he has ever given the best satisfaction to his employees, and acquired the respect and esteem of all who became acquainted with him.—*Camp Point Paper.*

RAIL AND WIRE.

BY THE AUTHOR OF "THE CLOUDS."

Rail and wire, by wheel and fire,
  Plying hard their joint vocations,
As they sweep o'er land and deep,
  Are bringing close the scattered nations.
    Over land the iron steed
    Swallows distance up in speed,
    And the chariot of the sun
    Is by courier wire outrun.
    Albion speaks to Hindostan;
    She replies ere dove or swan
    Could on swiftest pinion fly
    From Isle of Wight to Isle of Skye.
    Friction's drag is rent asunder,
    Lightnings speak, but not in thunder;
    Up they dash the breathless steep,
    Down they dive into the deep.
    Ocean bars the way no more,
    Shore is linked to furthest shore;
    And in weather fair or foul,
    Talk together cheek by jowl.
    Night no longer blocks the way,
    Darkness works as well as day;
    And while men and fishes sleep,
    O'er the land, and through the deep,
    Rush the fiery coursers on,
    Swift as thought, and mute as stone:
    Let us, then, with plaudits hail
    Steam and lightning, wire and rail!

Wheel and wire, by steam and fire,
  Are breaking up the whole foundations,
And blotting out the hate and doubt
  Which kept apart the jealous nations.
    Gates and walls are giving way,
    Mountain range and briny bay
    Ope their bosoms to embrace
    Men of every clime and race.
    Ancient laws are put to rout,
    Which erewhile shut aliens out;
    Pen-like, with fold on fold,
    Clings the new around the old.
    Commerce widens, traffic thickens,
    Errors languish, knowledge quickens;
    And by every conquest gained,
    Other triumphs are attained.
    One by one the scattered nations
    Join in mutual ministrations—
    East and West, and South and North,
    Pour their special treasures forth.
    Soon from pole to torrid zone
    Earth one common board will own,
    And Babel's curse be half forgot
    When men shall speak in polyglot;
    Let us, then, with welcome hail
    Steam and lightning, wire and rail!

Rail and wheel, and wire and keel,
  Are changing fast the old locations,
Nor will cease till pipes of peace
  Are handed round to all the nations.
    Men in troops the world are ranging,
    Crafts and occupations changing,
    Arts advancing, science, learning,
    Enterprise new conquests earning;
    And, as stones by streams are polished,
    Old aversions are abolished.
    Prejudice is giving way,
    Reason re-assumes its sway;
    Power departs from cast and hue,
    Customs old give place to new;
    Yokes relax and cease to gall;
    Fetters from the bondsmen fall.
    Forced to pride, as best it can,
    To own as man his fellow man;
    And the nations strive to find
    Fitting laws to guide mankind.
    Bigotry conceals its ire,
    Persecution damps its fire;
    Truth is finding open door
    Where the blind wall frowned before:
    Let us, then, with welcome hail
    Steam and lightning, wire and rail!

—*Chicago Railway Gazette.*

◆

THE Rome, Ga., *Daily Commercial*, speaking of the new telegraphic project of which Mr. Craig writes so copiously and enthusiastically in the New York papers, remarks: "We will venture the assertion that the system proposed by Mr. Craig proves a complete failure as to its successful competition with the "Morse System." The Western Union Company, although an immense corporation, and one that has fattened on the necessities of the people, has proven the most reliable agent the commercial and business world has ever had."

◆

ELECTRO-MAGNETIC CIRCUITS. — E. S. Hidden, Milburn, Mass.—This relates to improvements in relay instruments which break and make electro-magnetic circuits when another electro-magnetic circuit is broken or closed; such instruments are usually employed in connection with long circuits reaching from one place to another, in such manner that, when the long circuit is opened or closed, it shall act upon the relay instrument, so that the latter shall open and close a short or local circuit at the locality where a telegraphic message is to be received.

To Telegraph Superintendents.

We have now succeeded, for the first time, in getting a stock on hand of the following classes of Instruments, viz.:

No. 1 RELAYS,

BOX RELAYS,
With and without Keys.

SOUNDING RELAYS,
With and without Keys.

No. 1 SOUNDERS,

No. 1 KEYS,

No. 2 KEYS.

We shall also have, by the first of November,

A STOCK OF REGISTERS,

And of our new style of

Single and Double Cut Outs.

Now is the time to provide yourselves with superior instruments—superior to anything else in the market.

GRAY & BARTON.

CHICAGO, October 15th, 1870.

ATTENTION OPERATORS!

PAT. APPLIED FOR.

We would call your attention to our

Telegraph Operators Badge Pin.

It is a perfect fac-simile of the present MORSE KEY. It is made of 18 carat gold, ½ of an inch long, and makes a beautiful bosom pin, or can be worn on the vest. It is the only pin that has ever been made exclusively for Operators.

The Pin will be forwarded to any address by express C. O. D., or by mail on receipt of

PRICE, ... $5 00

All orders will be filled in the order in which they are received by addressing

HARVEY & DOW,
St. Johnsbury, Vermont.

A NEW ELECTRICAL THEORY.—A new general theory of the production of electricity was submitted by M. Delaune to the members of the French Academy, at a recent meeting. He asserts that it is heat which, polarizing bodies, is the general source of static and dynamic electricity; that under the influence of heat active bodies, which are bad conductors of electricity, produce static electricity; while active bodies, which are good conductors of electricity, produce dynamic electricity; that friction, pressure, and chemical action produce heat, and that it is this heat alone which is always the cause of electricity. This new theory joins many phenomena together which the multiplicity of theories has hitherto kept apart—chemical, thermo-electric and physiological currents, static electricity, produced by friction, pressure, cleavage, capillarity, electric fish, storms, &c.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
October 15, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Oct. 1, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

276 Alpine, Ala.
21 Beverly, Mass.
* Barbourville, W. Va.
367 Camden, Ill.
357 Coal Valley, Ill.
* Charleston, Kanawha Co., W. Va.
374 Hazlehurst, Miss, reopened
275 La Grange, Ga., reopened.
357 Orion, Ill.
446 Savannah, Mo.
466 Wellsville, Ks.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.	*Leaves this Line.*
Bark Lake, Ont.,	same as Beachburg, Ont.,	same as Beachburg, Ont.
Barbourville, W. Va.,	40 3	Catlettsburg, Ky.
Charleston, K. Co., W. Va.	70 5	"

OFFICES CLOSED.

Amelia C. H., Va.; Personsville, Pa.; Montgomery, White S. Springs, Va.; Hot Springs, Va.; Healing Springs, Va.; Rockbridge Alum Springs, Va., and Morton, Miss.

GENERAL INFORMATION.

The tariff from Pittsburgh, Pa., to the following offices on other lines has been reduced as follows:

Belle Vernon, Brownsville, Fayette Co., California; Cookstown, Elizabeth, and Monongahela City, Pa.—25 and 2.

Carmichael's, Davidson's Ferry, Greensboro, Jefferson (reopened), Pa.; Morgantown, W. Va.; Rice's Landing, and Waynesburg, Pa.—40 and 3.

Offices which have heretofore sent business for the above named points via Fairmount, W. Va., will continue to do so unless the rate via Pittsburgh is less, in which case the rate from Pittsburgh will be adopted and business checked accordingly.

Business for Cape Girardeau, Mo., should be sent and checked to Allenville, Mo. Allenville is in square 349.

The notice of the opening of the office at Clintonville, N. Y., has been overlooked by several offices. It was published in JOURNAL of October 1st, 1869. The tariff to Clintonville and the point where business "leaves this line" is the same as that on business for Plattsburg, N. Y.

The tariff to Virginia City, Nev., will hereafter be the same as to San Francisco, Cal.

OFFICES HAVING "SPECIAL SHEET A."

Hereafter you will check Mt. Clare and Camden Station, Baltimore, Md., at same rate as Baltimore, Md. Mt. Clare should also be checked direct, instead of to Camden Sta., as per JOURNAL of January 1, 1870.

CUBA CABLE BUSINESS.

INCREASE OF TARIFF TO HAVANA.

We are notified by the International Ocean Telegraph Co. as follows:

"On and after November 1st, 1870, over and above the present tariff to Havana is to be added the tariff of the Spanish Government, viz.: 40 cents gold for each ten words or fraction thereof.

ATLANTIC CABLE BUSINESS.

Altona and Apenrade, formerly Danish ports, are now in Prussia.

Beirut is in Second Region, Turkey in Asia.

Smyrna is in First Region, Turkey in Asia.

Kiachti is in Second Region, Russia—Siberia.

WILLIAM ORTON, President.

DISCOVERIES MADE BY ACCIDENT.

Not a few discoveries in the arts and sciences have been made or suggested by accident. The use of the pendulum, suggested by the vibrating of a chandelier in a cathedral; the power of steam, intimated by the oscillating of the lid of a tea-kettle; the utility of coal gas for light, experimented upon by an ordinary tobacco pipe of white clay; the magnifying property of the lens, stumbled upon by an optician's apprentice while holding spectacle-glasses between his thumb and finger, are well-known instances in proof of the fact.

Galvanism was discovered by accident. Professor Galvani of Bologna, in Italy, gave his name to the operation, but his wife is considered as actually entitled to the credit of the discovery. She being in bad health, some frogs were ordered for her. As they lay upon the table, skinned, she noticed that their limbs became strongly convulsed when near an electrical conductor. She called her husband's attention o the fact; he instituted a series of experiments, and, in 1780 the galvanic battery was invented.

Eleven years later, with that discovery for his basis Professor Alessandro Volta, also an Italian, announced his discovery of the "voltaic pile."

The discovery of glass-making was effected by seeing the sand vitrified upon which a fire had been kindled.

Blancourt says that the making of plate glass was suggested by the fact of a workman happening to break a crucible filled with melted glass. The fluid ran under one of the large flagstones with which the floor was paved. On raising the stone to recover the glass, it was found in the form of a plate, such as could not be produced by the ordinary process of blowing.

Glass pearls, though among the most beautiful, inexpensive and common ornaments worn by the ladies, are produced by a very singular process. In 1656 a Venetian named Jaquin discovered that the scales of a fish called bleak-fish possessed the property of communicating a pearly hue to the water. He found by experimenting, that beads dipped into this water assumed when dried the appearance of pearls. It proved, however that the pearly coat when placed outside was easily rubbed off, and the next improvement was to make the beads hollow. The making of these beads is carried on to this day in Venice. The beads are all blown separately. By means of a small tube the insides are delicately coated with the pearly liquid, and a waxed coating is placed over that. It requires the scales of four thousand fish to produce half a pint of the liquid, to which a small quantity of sal-ammonia and isinglass are afterwards added.

Landy Foot, the celebrated snuff manufacturer originally kept a small tobacconist shop at Limerick. One night, his house, which was uninsured, was burned to the ground. As he contemplated the smoking ruins, on the following morning, in a state bordering on despair, some of the poor neighbors, groping among the embers for what they could find, stumbled upon several canisters of unconsumed but half-baked snuff, which they tried, and found it so pleasant to their noses that they loaded their waistcoat pockets with it. Landy Foot, aroused from his stupor, imitated their example, and took a pinch of his own property, when he was struck by the superior pungency and flavor it had acquired from the great heat to which it had been exposed. Acting upon the hint, he took another house in a place called Black-Yard, erected ovens, and set about the manufacture of that high-dried commodity which soon became widely known as Black-Yard snuff. Eventually he took a larger house in Dublin, and making his customers pay literally through the nose, amassed a great fortune by having been ruined.

McKEE'S RAILROAD SIGNAL BOX.

All Signals connected with the Railroad service should be uniform, conspicuous, and ready to display at a moment's notice. Under the present system when an operator receives an order to detain a train, he has to take his flag, hunt a suitable place to stick it up, and keep running out every minute until the expected train arrives, to see that his flag or lantern don't get misplaced, or the view obstructed. More accidents occur from the proper signals not being shown than by any neglect on the part of operator or trainmen. The importance of having those Signals placed in a conspicuous position cannot be overestimated; it is the basis of all train dispatching by telegraph. This long needed improvement has been supplied in

"McKEE'S SIGNAL BOX,"

patented April 28, 1868, and February 8, 1870. This Box is in use on many roads, and all attest to its merits. Below we hand a few of the many letters we have received from railroad officials:

McKEE & CO.

GENTLEMEN: I am very happy to express the satisfaction that McKEE'S TELEGRAPH SIGNAL BOX has given since its adoption on this road, and especially when, on riding over other roads, I see how superior our system of displaying Telegraph Signals is to that practiced elsewhere.

ROBERT HARRIS,
Gen'l Sup't C. B. & Q. R. R.

MESSRS. McKEE & CO.

The SIGNAL BOX got up by Mr. William McKee has been in use on this road for the past year, and gives general satisfaction. The facility with which the flag or lamp can be displayed and the operator remain beside his instruments, its safety, simplicity, and durability, recommend it as an invaluable adjunct in working a railroad, and I cheerfully attest to its merits.

CHAS. R. PEDDLE,
Gen'l Sup't Terre Haute & I. R. R.

MR. McKEE.

DEAR SIR: I will say that your SIGNAL BOX has been adopted on this line of road, and gives entire satisfaction. I do not hesitate to recommend it as the best arrangement for the protection and display of Railway Signals I have yet seen.

J. C. McMULLEN,
Gen'l Sup't Chi., Alton & St. Louis R. R.

We have many other letters of a similar character.

We are now prepared to furnish any number of BOXES on short notice and reasonable terms, or will sell rights to companies to manufacture and use on their respective roads. The attention of R. R. Telegraph Superintendents is especially called and correspondence solicited.

McKEE & CO., Neponset, Illinois.

M. A. BUELL,

MANUFACTURER OF

Telegraph Instruments and Supplies

OF ALL KINDS.

ELECTRO MAGNETO MACHINES,
SURVEYORS AND MEDICAL INSTRUMENTS

NEATLY REPAIRED.

SEND FOR CIRCULAR.

M. A. BUELL,
26 WARING BLOCK,
Cleveland, Ohio

ELECTRIC TELEGRAPH WORKS.

FLEMING, POTTER & CO.,

N.-W. Cor. SECOND & CHESTNUT STS., PHILADELPHIA,

MANUFACTURERS of every description of

TELEGRAPH INSTRUMENTS,
ELECTRICAL APPARATUS, and
RAILWAY SIGNALS, &c.

☞ Inventor's Models carefully attended to. ☜

GEO. W. SHAWK. WM. W. FOOTE.

SHAWK & FOOTE,

Electrical Instrument Manufacturers,

AND DEALERS IN

TELEGRAPH SUPPLIES,

55 Center street, Cleveland, O.

REPAIRING NEATLY DONE.

July tf

FRANK L. POPE,

TELEGRAPHIC AND ELECTRICAL ENGINEER,

Nos. 78 and 80 Broadway, Room 48,

NEW YORK.

$1,000 REWARD

For any case of *Blind, Bleeding or Itching PILES* that DE BING'S PILE REMEDY fails to cure. It has cured cases of 20 years' standing. Try it, and get rid of the most troublesome disease flesh is heir to. SOLD BY ALL DRUGGISTS.

Laboratory—142 Franklin-st., Baltimore Md. June 15-1y

CHARLES WILLIAMS, Jr.

109 Court Street,

BOSTON, MASS.,

MANUFACTURER OF

TELEGRAPH INSTRUMENTS,
BATTERIES,
AND MATERIALS OF ALL KINDS.

WM. KIDD, C. H. PEIRCE,
A. BOODY. C. S. OTIS.

KIDD, PEIRCE & CO.,

BANKERS,

19 BROAD STREET AND 57 EXCHANGE PLACE,
NEW YORK.

Stocks, Bonds, Gold and Government Securities bought and sold on Commission.

CHAS. T. & J. N. CHESTER,

104 CENTRE STREET, N. Y.,

TELEGRAPH ENGINEERS,

And Manufacturers of

INSTRUMENTS, BATTERIES,

AND EVERY DESCRIPTION OF TELEGRAPH SUPPLIES,

Offer the best guaranty of excellence in their profession—in their long established business—in the extent and variety of their manufacturing facilities—in the many improvements introduced by them, now almost universally adopted or imitated—and in the extent of their business, domestic and foreign, enabling them to keep pace with telegraphic progress.

They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer.

CHESTER. PARTRICK & CO.,

Manufacturers and Dealers in all kinds of

TELEGRAPH INSTRUMENTS AND SUPPLIES,

24 SOUTH FOURTH STREET, PHILADELPHIA,

Now offer for sale, or will manufacture to order,

REGISTERS,
RELAYS,
KEYS,
LIGHTNING ARRESTERS,
SOUNDERS,
SWITCHES,

And every variety of instruments now in use. Among the supplies constantly kept on hand, are the following:

Battery Materials of all kinds, ine Wire, all sizes, Brackets, Insulators, Medical Batteries (induced or direct current), Fire and Burglar Alarms for Banking Houses and Private Residences, as well as for Cities and Towns; also Contractors for the Construction, Reconstruction and Repair of Telegraph Lines throughout the United States.

All the Standard Works on Telegraphy furnished at the lowest prices, among which is the latest work of

MODERN PRACTICE OF THE ELECTRIC TELEGRAPH,

By Frank L. Pope.

Also, Electro-Platers' Batteries and Materials, Blasting Apparatus, Cartridges and Patent Portable Machinery for the manufacture of Nitro Glycerine.

All orders executed with promptness, and satisfaction guaranteed in the quality of articles supplied.

Improved Telegraph Wire.

The attention of Telegraph Companies and Builders is invited to the Compound Steel and Copper Wire manufactured by the

AMERICAN COMPOUND TELEGRAPH WIRE COMPANY.

Agents in New York,

MESSRS. L. G. TILLOTSON & CO., No. 11 Dey street.

THIS IMPROVEMENT

has already been quite extensively introduced, and it is confidently believed, that by the natural laws of progression, is destined to supersede iron wire for Telegraphs, because of its superior working capacity under all conditions of weather.

THE WEIGHT OF THE COMPOUND WIRE

is but about one-third that of an equivalent conductor of iron, and its conducting capacity may be largely increased with but slight increase of weight. In consequence of this lightness, together with its

GREAT AND UNIFORM STRENGTH,

but one-third of the number of poles are necessary that are required in iron wire construction, thus largely improving the Insulation and combining Economy in Construction and Reconstruction, with superiority in working.

THE WINTER TESTS

have proved its durability and capacity to successfully resist breakage from sleet and wind storms, and one of the testimonials received to this effect states that during a certain severe sleet storm the Compound Wire remained intact, while a high cost Norway Iron Wire, in the same locality, and strung at the same time, was broken in several places.

Address—

AMERICAN COMPOUND TELEGRAPH WIRE COMPANY,

ALANSON CARY, Treasurer,

No. 234 West 29th street,

New York.

Agents of the Company

To Telegraph Managers and Superintendents.

We are now making and keep on hand a style of

GALVANOMETER

for measuring resistances, which has the following merits:

1. It is designed especially to meet the wants of

TELEGRAPH SUPERINTENDENTS

and operators, and for use on telegraph lines, having a range from a small fraction of

1 OHM TO 14,000,000 OHMS,

to measure either instruments, lines or insulation with equal convenience.

2. It is made on the

WHEATSTONE BALANCE

principle, which is the most

RELIABLE AND ACCURATE

method of measuring resistances, involving less liability to error than any other.

By this plan it is the resistance itself which is

MEASURED DIRECTLY,

and not some other thing from which the resistance has to be computed by a series of calculations. Its use is therefore

EASILY LEARNED

in a few minutes time.

3. It is

LIGHT AND PORTABLE,

the whole being contained in a small box which a man can easily take in one hand like a valise.

By our arrangement of connections and resistance coils a great range of measurements is obtained without the usual drawback of a cumbersome and heavy box.

4. To bring the instrument into general use we put the price at the low figure of $100, with $10 extra for an outside case and set of flexible cord connections.

GRAY & BARTON,

CHICAGO.

AMERICAN FIRE ALARM

AND

POLICE TELEGRAPH.

GAMEWELL & CO., PROPRIETORS,

NO. 104 CENTRE STREET, NEW YORK.

This system of Fire Alarm Telegraph, with a central office, or upon the

AUTOMATIC PLAN,

is now in operation in the following cities, to which reference is made for evidence of its great SUPERIORITY AND VALUE, and UNIFORM reliability:

BOSTON,
CHICAGO,
PHILADELPHIA,
CINCINNATI,
ST. LOUIS,
BUFFALO,
BALTIMORE,
MOBILE,
NEW ORLEANS,
PITTSBURG,
LOUISVILLE,
ALLEGHENY,
MONTREAL,
QUEBEC,
PORTLAND,
ST. JOHN, N. B.,
HARTFORD,
TROY,
NEW HAVEN,
ROCHESTER,
SPRINGFIELD,
TOLEDO,
ALBANY,
COLUMBUS,
LAWRENCE,
MILWAUKEE,
SAN FRANCISCO,
CAMBRIDGE,
WASHINGTON, D. C.

The distinctive features of

THE AMERICAN FIRE ALARM TELEGRAPH

are a Combination of Circuits, the Automatic Signal Boxes, Electro-Mechanical Bell and Gong Strikers.

THE AMERICAN FIRE ALARM AND POLICE TELEGRAPH is covered by some twenty patents. Very early after its introduction into Boston, GAMEWELL & Co. purchased the original patents of FARMER & CHANNING, and during the past fifteen years have spared no expense or pains to improve and perfect this system.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

THE

BISHOP GUTTA PERCHA WORKS,

422, 424, 426 East 25th St., N. Y.,

SAMUEL C. BISHOP,

PROPRIETOR,

ONLY AMERICAN MANUFACTURER

OF

PURE GUTTA PERCHA GOODS

IN THE

UNITED STATES.

Have on hand and made to order

SUBMARINE TELEGRAPH CABLES,
INSULATED WIRES, for
TELEGRAPH AND ELECTRIC USE, and for
BLASTING AND MINING PURPOSES,
in every variety desired.

As an Insulation for Telegraph Cables and Electric Conductors GUTTA PERCHA has been universally adopted by all scientific and practical Electricians and Manufacturers of Telegraph Cables and Wires in this country and Europe, and has sustained, with increasing confidence in its superiority, the practical test of over twenty years' general use.

The PROPRIETOR *would say to all parties desiring*

SUBMARINE TELEGRAPH CABLES,

that he will guarantee to make and deliver at his Factory an 'le of Cable, Insulated with Gutta Percha, as low as they can IMPORT *Cable of the same style and quality.*

ORDERS RECEIVED AT THE FACTORY.

Messrs. L. G. TILLOTSON & CO.,

8 *DEY STREET, NEW YORK,*

AND

BLISS, TILLOTSON & CO.,

247 So. Water St., Chicago, Ill.,

have been appointed by me GENERAL AGENTS for the sale of any Telegraph Cable or Wire manufactured at the Works in New York, at Factory Prices, delivered in New York.

JOHN THORNLEY, 503 Chestnut St., Philadelphia,

has been appointed Agent for the sale of any and all goods manufactured by me, at Factory Prices, delivered in New York.

Any goods of my manufacture (*except Telegraph Goods*), are for sale in New York, by

H. G. NORTON & CO., 26 Park Place,
RUBBER CLOTHING CO., 347 Broadway
A. D. & C. A. MAN, 201 Broadway

SAMUEL C BISHOP

OFFIC . ORY.

L. G. TILLOTSON & CO.

5 Dey Street, New York,

MANUFACTURERS OF

TELEGRAPH INSTRUMENTS

AND

MATERIALS OF EVERY DESCRIPTION.

General Agents for the

AMERICAN COMPOUND TELEGRAPH WIRE COMPANY.

The Compound Wire has now stood every test to which it can be subjected. Over twelve hundred miles of it are now in operation with the most satisfactory results.

General Agents for S. C. Bishop's

TELEGRAPH CABLES,

GUTTA PERCHA AND OTHER INSULATED WIRES

General Agents for

PURE NITRIC AND SULPHURIC ACIDS

Manufactured by the Lodi Chemical Works

Importers of the best manufacture of

ENGLISH GALVANIZED WIRE

Publishers of Prof. J. E. Smith's

MANUAL OF TELEGRAPHY.

GROVE,
CARBON
HILL'S,
DANIELL'S,
And every description of

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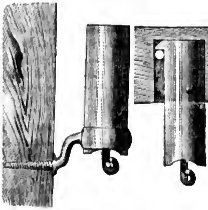

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JOURNAL OF THE TELEGRAPH.

VOL. III. NO. 23. NEW YORK, NOVEMBER 1, 1870. WHOLE NO. 72*.

ENGLISH TELEGRAPHIC EDUCATION.

A writer in the London *Standard* says: "The preliminary examination, just concluded, for appointments in the Indian telegraph service has resulted, it is understood, in the rejection of nearly three-fourths of the nominees. The papers of questions proposed appear to have been fairly adapted to the grade of the examination, and within the knowledge which might be expected and demanded reasonably from adults. The failure of so large a proportion, comprising many gentlemen who had been rejected once already, a year ago, points beyond question to defects in preparatory training and instruction. Were nominees for government appointments selected only from amongst youths who could present a certificate of competent elementary knowledge, and of good conduct, from some school under government or university inspection, a powerful check would be placed on the further growth in numbers of the class of schoolboy, which is the despair of tutors and the scourge of many a family—the boy who indulges a taste for incorrigible idleness, not unfrequently accompanied by insubordination in his later school days, trusting to the supplementary aid of a subsequent "crammer." Under the present system the greatest possible amount of disappointment and loss is inflicted on parents, who, having procured a nomination for ill-taught and often for unteachable youths, mulct themselves of considerable sums to present them again and again for some simple examination, at which they are rejected, to fall back useless and unmanageable on their hands at last. This result is promoted also by allowing nominees once plucked to present themselves a second time—an, in effect, cruel indulgence, conceded, not only to preliminary nominees, but to passed nominees in their subsequent examination. In regard to these latter, the pernicious effect of this licence, joined to the grant of public money for the professed purpose of defraying the expenses of their education, is unmistakably manifested. Young men gleaned from all manner of sources—professional or mercantile clerks, unsuccessful competitors for commissions in the army, ex-university undergraduates, and lads fresh from school—delighted with the possession of a sum of money to supplement the home allowance, consign themselves to the enjoyment of the hour, awaiting the experience of a first pluck, which confers no disgrace, to settle down to orderly life and persevering, serious study. It were much to be wished that there existed some duly constituted engineering or civil service college, to which the recipients of national aid might be remitted for training, or that room might be made for them, and for students of scientific professions generally, and a staff of instructors, provided at our existing universities, public schools, and proprietary colleges."

The writer of the above may not possibly be fully aware of the nature of the examination to which nominees are submitted. We cannot do better than refer our readers to an article which appeared in this journal of the 15th of January last, in which the writer ably reviews the whole question. We think it better to reproduce the following extract from it:

SCOPE OF EXAMINATION.

The first, or as we shall call it for the sake of distinction, the preliminary examination to be attended by nominees, is arranged under the following heads: History, divided into Greek, Roman, English, and Indian, with a maximum of 250 marks in each, making 1,000 marks in all, out of which 400 are required as a minimum, in order (and this is an important point to mark) to enable the questionist to score at all under the head; Geography, Indian and general, 350 each, giving 700 as the maximum, 330 the minimum, as before: Mathematics, lower and higher, arranged as follows:

Arithmetic, including square and cube root	450	200
Mensuration	200	100
Book-keeping	250	100
Euclid, I., II., III., IV., and VI. Books	450	200
Algebra, to quadratic equations	450	200
Plane trigonometry, including heights and distances, and the use of logarithmic tables	650	300
Higher mathematics	1800	150

Giving to lower a maximum of 3,000, the minimum being fixed at a little less than one-half the marks in each subject; whilst higher mathematics, commanding 1,800 as the minimum, allows a student to score after a minimum of 150.

LANGUAGES.

Latin	500	100
Greek	500	100
Any one or two of the following modern languages, viz.: French, German, Italian, Hindustani; not more than two modern languages being permitted to be taken up	500	200

ART AND SCIENCE.

And, lastly, Art and Science, thus distributed: Drawing 500, minimum 100 each in freehand and mechanical; chemistry, 500, minimum, 150; electricity and magnetism, 500, minimum 150; heat, light, and sound, 500, minimum 150. Thus is made up a minimum of 3,000, a maximum of 9,200 marks.

THE SELECTION.

Out of the nominees, the memorandum goes on to say, who qualify by gaining the above minimum, are selected in the order of merit, so many as may be needed, who are required to attend for not less than six months, a physical class approved by the Secretary of State for further instruction in mathematics and physical science, and on producing a satisfactory certificate from the master to this effect, are then admitted to a second test examination. This passed, the student is required to place himself under a qualified telegraphic engineer. He is afterwards allowed to proceed to India, there to join the department as an assistant of the fourth class, at £240 per annum, to be increased to £270 on passing in one vernacular language at the end of one year. To cover the expense of study after the preliminary examination is passed, a grant of £100 to each student is made by Government, to which is added a further £100 on quitting England, to defray the expense of his passage. The memorandum then exhibits a table of the grades, with their stipends, of the whole staff in India, six in all, rising from £240 to the post of director-general, at £3,600 per annum.

[*Electric Telegraph Review.*

DISTRIBUTION OF HEAT IN THE CIRCUIT.

From Professor Tyndall's Notes.

1. When the two ends of a voltaic battery are connected by a thick wire of good conducting material the wire is not sensibly heated; the heat due to the oxidation of the zinc is in this case confined to the battery itself.

2. But if the two ends of the battery be connected by a wire that offers a resistance to the current, the wire is heated, and may, if properly chosen, be raised to a white heat.

3. Considering the battery as the hearth where the zinc is burnt, we might be led to infer that the heat due to the combustion of the zinc is liberated on the hearth itself, and that its amount depends solely upon the quantity of zinc consumed.

4. This, however, is not the case. Let the battery, with its two ends united by a thick wire, be surrounded by a vessel of water, to which the heat developed by the oxidation say of an ounce of zinc is communicated; the quantity of heat developed is measured by the rise of temperature of the water.

5. Let the battery, with its two ends united by the resisting wire, be placed in the same vessel, and let the heat generated in the battery by the oxidation of an ounce of zinc be again determined; this heat will be less than that observed in the last experiment.

6. If the connecting wire be now inclosed in a separate vessel, and if the heat generated in the wire be thus determined on adding this amount of heat to that liberated in the battery, a total heat is obtained exactly equal to that generated in the battery alone when the good conducting wire was employed.

7. In fact, the absolute amount of heat generated by the oxidation of an ounce of zinc is perfectly constant; but it may be distributed in various proportions between the battery and the external circuit.

Relation of Heat to Current and to Resistance.

1. On what does the heat developed in a wire uniting the two ends of a voltaic battery depend?

2. It depends, in the first place, on the strength of the current, but it is not simply proportional to that strength.

3. Let the strengths of a series of currents, determined either by the tangent-compass or the voltameter, be represented by the numbers 1, 2, 3, 4, then the quantities of heat developed in the same wire by these respective currents are expressed by the numbers 1, 4, 9 and 16.

4. The heat generated is therefore proportional to *the square* of the strength of the current.

5. Preserving the strength of the current constant the heat generated is proportional to the electrical resistance of the wire through which it passes. These important principles were established by Joule.

6. Thus if one of two equal currents pass through a silver wire, and the other through a platinum wire of the same length and thickness, the heat generated in the platinum will be ten times that generated in the silver, because the resistance of the former

is ten times that of the latter. To urge the current through the platinum in this case would, however, require greater battery power than that necessary for the silver.

7. Hence, when *the same current* is sent through a wire composed of alternate lengths of silver and platinum of equal thickness, the platinum spaces may be raised to a white heat, while the silver is not raised to the faintest glow.

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SEACOAST LINES.

From the Report of the Italian Administration.

The telegraph lines suspended for any great distance by the seashore are generally, as regards insulation, in a very unfavorable situation compared with lines crossing the interior country. The inconveniences to which coast lines are subject are of two kinds: first, the results of the mechanical action of the winds and storms, to which, of course, land lines are subject, but in a lesser degree, and then the peculiar influence of the sea itself. This second class of results are of a more delicate nature, because they relate directly to the insulation of the wires. Up to this time, it has been impossible to attain complete insulation, and though we can be satisfied with the degree of perfection we have attained, it is not all that can be desired. We lay aside the inconveniences of the first category, occupying ourselves briefly with the second. It has been proved that in the neighborhood of the sea, the atmosphere is largely impregnated with salt. Only a very simple experiment is necessary to convince us of this fact. Let a few leaves be plucked off a tree standing in the vicinity of the sea, and tasted. The presence of sea salt is immediately made known, on touching the leaf with the tongue, by the brackish flavor. It is not to our purpose to explain the reason that this salt is present; its effects on telegraphic insulation is the point we now consider We know that the definition of *conductors* and *insulators* has no other signification than that of expressing the various degrees of resistance that different bodies oppose to the transmission of electricity, since there does not exist in nature any body that insulates perfectly. Porcelain, ordinarily used as the material for insulators, presents, under common care, sufficient resistance to the electric current for the purposes of telegraphy. In practice, however, certain circumstances intervene, which cause it to lose much of its insulating property; such as the facility with which the humidity of the atmosphere collects on its surface, and thus coats the insulator with a conductor of a comparatively high degree. In the case of seacoast lines, another difficulty presents itself in the encrustation of sea salt. This salt is largely deposited on the insulators, poles, and wires, and being a good conductor, it readily offers the electric current a passage to the earth. Each of these leakages, though small in itself, goes towards forming a sum total that greatly interferes with the working of the lines. The remedy that suggests itself is to enlarge the diameter of the wires so that they offer a readier path for the current in the right direction. . But as this remedy is available only to a certain extent, it became necessary to consider in what manner the insulators could be made less conductive. Of all the insulators tried, the double bell yielded the best results; yet this form was not fully effective. The next thing to be done was to reduce the number of the points of support, and consequently increase the distance between the poles; at the same time increasing their strength. Besides that, the injected pine poles readily broke under the great strain thrown upon them by this arrangement, the fibre of the wood was found to be readily impregnated with the humidity of the atmosphere, and thus to acquire a high conductivity. Poles of a closer grain were required, and chestnut wood seemed fully to answer the requisition. The poles were strengthened by stays and struts. But, in addition to this, the most efficacious plan, and that ultimately adopted and now in use, was to tie the wires to the insulators with a ribbon of tarred hemp, winding the ribbon, as a covering, round the wire for about a yard on each side of the post. By adopting this plan, and by carefully washing the salt from the insulators at fixed periods, the electrical and commercial results have been greatly advanced.—*Electric Telegraph and Railway Review.*

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ASPHALTE TUBES FOR UNDERGROUND LINES.

Of what material the tubes used to protect and form a subway for underground wires shall be made, has long been an open question. M. Collette, of the Netherlands Telegraph Administration, has submitted the following interesting facts with regard to the employment of asphalte.

In 1865, a trial line, nearly 8,000 yards in length, was laid in asphalte tubes in the streets of Amsterdam. These tubes have each an interior diameter of 3 inches (about 75 millimetres), and are 7 feet (2 metres 134 millimetres) in length. They are jointed to each other by the aid of muffles of short pieces of tubing 4 inches in interior diameter, the interstices being run with bitumen. The laying was executed without the least difficulty. Only six copper wires, covered with a double coat of gutta percha, were, in 1865, introduced into the asphalte tubes; but two years after, this number was augmented to 25 wires. It is from this occasion that we have been able to ascertain that the wires withdrawn from the tubes, after having been worked during two years, were in such perfect condition that they were replaced with the 19 new wires. The asphalte tubes, since they were laid, have three times been uninjured by accidents which cast iron tubes would have been unable to resist, and, doubtless, in breaking, would have injured the wires.

Five years have elapsed since the laying in Holland of the first line in asphalte tubes, and, hitherto, scientific men have not been deceived in their expectations. Also the Netherlands Telegraph Administration has not hesitated to follow the path dictated by experience. In January of the present year, a length of 10½ miles of underground lines was laid in asphalte tubes. The maximum number of wires introduced into the tubes, having 3 inches internal diameter, amounted to 40.

The tubes are chiefly manufactured at Hamburg, and the prices are as follows: For tubes 7 feet in length and 3 inches in diameter, $1.00 per length; for those having the same length and 2 inches in diameter, the cost per length, including muffles for jointing, is about 75 cents. Tubes having other dimensions have not yet been constructed in Holland.

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THE ELECTRIC LIGHT.

There is no doubt about the value of the electric light, if we had any way of making it without the necessity of putting together a complex battery of cups, or of driving a magneto-electric machine by steam. Its actinic property has been incontestibly proved, and its power to penetrate the densest fog has been shown in lighthouses and on our steamers. Hence the desire to have its manufacture placed within easy reach. Wilde's ingenious and beautiful machine, as shown at the Paris Exhibition of 1867, requires the use of a steam engine for revolving it, and is therefore unavailable, excepting for large establishments or on board of steamships, where a donkey engine could furnish the power without additional cost. The French steamers are furnished with the most complete apparatus that we have thus far seen. The lantern in which the carbon points are placed is carried with the utmost precision by clock work, and the power of the light is greatly increased by the use of a Fresnel lens. The light cast by such a lamp could be distinctly seen for several miles, and, by means of a telescope, the names of vessels two miles away could be easily read. Experiments with the electric light have been tried by the Prussian army. They have succeeded in casting a gleam of light upon the fortifications of the enemy, and of disclosing their movements far beyond the reach of their guns. The light can be thrown so far that it is necessary to use a telescope to follow in its path, and discover what it reveals.

The value of this form of artificial light in the photographic profession has led to numerous inquiries for a practical magneto-electric machine, and Mr. Moses G. Farmer of Boston is said to have invented a thermo-electric battery that answers every purpose. We have heard nothing of this battery very recently, but trust that what has been said of it may prove true. The thermo-electric pile is essentially made up of couples of different kinds of metals, and the heat applied is usually that of a Bunsen burner. When the current from such a battery is made to pass round an electro-magnet, the magnet can be made to support a hundred-weight. When passed through a small induction coil very tolerable sparks can be obtained, and other interesting experiments can be performed with it. If the thermo pile can be contrived to carry the electric light, it will prove to be one of the most important inventions of the day.—*Journal of Applied Chemistry.*

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Measurement of the Velocity of Cannon Balls by Electricity.—A very ingenious instrument is described in *Nature*, No. 45, for September 8, known as Noble's Chronoscope, for measuring the velocity of shot during its transit through the gun. The tube of the gun is fitted inside at certain intervals with metal rings (to the number of six or eight) the outside margins of which are sharpened into knife-edges. On a shot passing along the tube, and through these rings, the edges of the latter are jammed down upon and made to cut through the ends of various insulated wires, one of which is placed under each ring. Each of these wires is connected with an electric battery; and as one wire after another is cut through, and the insulation removed, an electric current passes, and a number of electric sparks follow one after another, according to the number of rings and wires. The recording of the signals is accomplished by means of a series of metal discs, one in connection with each wire, which are made to revolve at a certain known velocity. The surface of the discs is of polished silver, coated with lamp-black. As soon as a wire is cut by the passage of a shot a spark hops over to the recording disc, removing a little of the lamp-black coating and thus marking the place by laying bare a minute spot of bright metal. From the relative position of the successive spots on the discs, and the known velocity at which they revolve, a simple calculation determines the velocity of the shot. A shot usually takes from $\frac{1}{300}$ to $\frac{1}{100}$ of a second to traverse the whole length of the bore of a large gun, its speed being somewhat slow when passing the first rings, and increasing as it approaches the muzzle of the gun. From the extreme delicacy of the instrument, the calculation can be made with precision to a millionth part of a second, and the velocity determined with the greatest accuracy.

ACTION OF LIGHTNING ON TELEGRAPHS.

Mr. S. A. Varley read a paper at the British Association: "On the Mode of Action of Lightning on Telegraphs, and on a New Method of Constructing Telegraph Coils." Lightning protectors were very generally adopted in the early days of telegraphy, but subsequently were practically abandoned, as they were found not to save the coils, or only exceptionally. When storms occurred in the neighborhood of telegraph circuits, powerful electric currents were often induced in the telegraph wires, which in some cases might be strong enough to fuse the coils, but which more often demagnetized or reversed the magnetism of the magnetic needles inside the coils. The interruption which lightning caused on telegraph circuits was more important than the destruction it caused to the apparatus. Needle telegraphs were very generally employed by railways, on account of their simplicity, and communication on railways was consequently liable to serious interruptions when storms occurred. In 1866, the writer introduced instruments which he believed to fulfill most of the conditions of an efficient instrument, and gave the result of direct experiments with electricity of tensions varying from 12 to 700 cells of Daniell's battery, which had furnished the data from which he had designed his lightning bridge. The construction of the lightning bridge, which consisted of two metallic-pointed conductors, approaching to within one-eighteenth of an inch, and surrounded with a mixture of conducting and non-conducting matters in a minute state of division, was then described. The action of the lightning bridge, placed in a circuit struck by lightning, was next described; the lightning found in its direct path a bridge of conducting particles in very close proximity to one another, which were connected under the influence of the discharge, and the matter, rendered highly incandescent, offered a very free passage to the secondary current developed by the demagnetization. There are upwards of 1,000 of these bridges doing daily duty in this country alone, and not a single case of a coil being fused when protected by them has occurred. The change in the administration of the telegraphs had been inaugurated by the adoption of induced magnets for needle telegraphs, and, consequently, a great impulse has been given to their introduction. This form of coil has been adopted by the Government.—*Electric Tel. Review.*

DESCRIPTION OF A BUSY TELEGRAPH OFFICE.

Dear Editor: I have seen in your columns a number of descriptions of telegraph offices. Let me give your readers a few notes on ours, though no written portrait can convey a correct idea.

The operating room is small—only 13 by 13½ feet—with an extension from one end of a space 5 by 7 feet, where the bookkeeping is done. Thirteen wires run in from the front window, through cleats, to the back of the operating room, where they descend to the Cuigan switch. The instrument wires run up from the switch, through the same cleats, back to a long cleat in the center of the ceiling; thence all concentrate to a circle eight inches in diameter, thence down through the operating table. All the wires touch nothing excepting the cleats, and are carried from point to point with mathematical exactness, presenting an airy and assuring appearance of perfect freedom from the possibility of hidden crosses, escapes, or cross-currents.

The instruments are set upon a table, constructed as follows: From the ceiling to the floor is a pillar, turned tastefully. This pillar passes through a black walnut table six and a quarter feet in diameter, which is circular, and which rests upon eight brackets, extending from a point nine inches from the edge back to the pillar. The top of the table is divided by eight upright ash brackets into eight compartments, which extend from a circle twelve inches from the edge of the table to a circle near the center of the table. These brackets are six inches high, and serve to shut off the sound of all the instruments except the one from which one may be receiving. The keys and instruments are set at a convenient distance from the edge of the table, and under each compartment is a snug little ash-fronted drawer, sixteen inches. Above the table is a wheel four feet in diameter, which is very light, and which revolves easily on the circular hub through which all the wires (twenty-six in number) pass. The band of this wheel is of steam-bent ash, and it has eight black walnut spokes, which are set in a hollow hub of ash. On the outer surface of the band or tyre are the names of all the offices with which we work direct, and under the name the call; also a hook of No. 16 steel wire, pointing inwards, so that the messages cannot fly off, no matter how rapidly the wheel may be whirled.

Inside the tyre, opposite the names outside, are the calls in large letters, so, without turning the head one knows the next destination of every message in the office not sent.

When the wheel is in its proper position, the names of the offices to which the business is to be sent at any one instrument are directly above that instrument; and, after the wheel has been moved, it is always immediately replaced. There are fifty-six hooks on this wheel.

The advantages of this unique and entirely new arrangement of a telegraph office are great. Messages going through are being sent while they are still being received. One can distribute, without moving or breaking, all he receives as fast as they come.

Besides the instruments on this table, we have two more, which have been put in since the large table was put up, and are placed, one on the bookkeeping shelf and one near the receiving window.

Each operator has the entire business under his eye, and, though there have been but four of us for a year past, we have managed to do the work which is made by five or six thousand local and eight thousand through messages per month, with no receiving or delivery clerk, and only two messengers. I think that, with the ordinary arrangement of offices, we could hardly have handled the same business so promptly.

The noise of the instruments makes it somewhat difficult, at first, to receive, but this soon wears off, as one becomes accustomed to the peculiar sound of each instrument. This is the first thing of its kind, and is open to improvement. It has some points of vast importance to the prompt handling of business. The table is stand-up height, for the reason that, having no receiving clerk, the several operators have to go to the window about one hundred and fifty times a day; and it would be too much of a bore to jump up from a chair. We use high stools, when we wish to sit down.

It might be worth a visit from headquarters, for we certainly can repeat messages quicker than any office under the sun. Come and see it—it has had nearly a year's trial, and is, therefore, no fledgling.

The table is made of black walnut and ash, and the general appearance is fine. The whole is kept from turning by a double brace on two sides, made of $\frac{5}{8}$ square iron, and from moving up or down by the eight bracket supports, so that it is the firmest, staunchest piece of furniture to write on you could wish.

Yours, lengthily, S.

THE INSPECTION OF THE LINES.

My Dear Mr. Reid: You kindly invite practical suggestions. I have one to make. All railways have a road master whose duty it is to supervise the repairs, and is expected to know what repairs are needed and how to make them. If the man is competent to fill his position, hundreds of accidents and interruptions are prevented yearly. In the telegraphic system, as I have seen it, but few interruptions are anticipated. When a line cannot be worked any longer a repairer is sent out to fix it up and instructed to hurry back to the office to be ready to go out in case of trouble at some other point. I have had some experience in this matter, and am satisfied that if a competent line master was appointed to every three hundred miles of line and his limits so arranged that he could inspect it two or three times a week, the efficiency of the wires would be greatly increased, and two-thirds of the "grounds" and "crosses" which now so seriously interrupt the working of the lines, could be prevented. Repairers are like other men; some are competent and industrious, while others are both incompetent and lazy; but if they are brought under the eye of a competent line master who could see them and their lines two or three times a week, their line, like the track of a railway, would always be in order, or it would be known who was to blame for it, while, as it is now, there is no telling. This department of telegraphing (the lines and batteries) is, I am glad to see, beginning to receive the attention it merits, and I venture to predict that in a few years the line master will be as indispensable a part of the telegraph system as the road master now is in the railway system. K.

A MAN HOLDING SEVENTEEN OFFICES.

Utica, Pa., Oct. 1879.

To the Editor of the Journal of the Telegraph

Dear Sir: I saw in one of the Journals some time since a statement of the numerous offices filled by one man. I think he stated he was manager of a telegraph office, night and day operator, message boy, clerk and porter. I think I can beat that. I am railroad agent, freight agent, ticket agent, station baggage man, clerk for railway, porter for railway, agent for United States Express, money clerk and porter; manager for W. U. Tel. Co., day operator, night operator, receiving clerk, forwarding clerk, error clerk, message boy and porter. If there is a man that fills more offices than that in the employ of the W. U. Tel. Co., I would like to see him and shake hands with him. Yours, &c., B.

A New Galvanic Battery.—An important addition has been made to chemistry in a new, very powerful, and simple form of galvanic battery discovered, though not yet described, by Bunsen. In this second Bunsen's battery, only one liquid, a mixture of sulphuric and chromic acids, and, therefore, no porous cells, is employed. The plates of zinc and carbon can all be lowered at once into the liquid and raised again at will. The electromotive force of this battery is to that of Grove—the most powerful of known forms—as 25 to 18; it evolves no fumes in working, and can be used for a very considerable length of time without serious diminution of the strength of the current, so that Bunsen writes that no one who has once used the new battery will ever think of again employing the old forms.

Still Another.—Mr. C. S. Jones, Manager of the Western Union Telegraph Office at Albany, N. Y., has invented a new battery which can be maintained at a minimum cost, is fumeless, and in which refuse metals of all kinds can be employed.

THE DOUBLE SPRING.

New York, Oct. 24, 1870.

To the Editor of the Journal of the Telegraph:

Perhaps the following will interest the readers of the Journal. The regular battery force on a wire is 48°, but an escape of 17° has come in, and while adjusted for breaks the Relay here does not record our writing. If we make dots, it is silent; if dashes, it responds with dots, or the fractions of dashes. Why is it? Let 's see if we can explain the reason. When the line is clear, the attractive power of the magnet corresponds to the 48°. We stiffen the adjusting spring to the resistance of say 5° for the backward movement of the armature, and have left 48° available attraction for the forward stroke. No trouble in getting writing under these circumstances. Now comes in an escape of 17°, and, in consequence, the difficulty mentioned. The original battery force being 48°, an escape of 17° increases the attractive power to 65°. To allow for the escape, we make the resistance of the spring 17°, which, deducted from 65, leaves 48°. We now add 5° to the resistance for the back stroke of the armature, making it 22°, and observe that the resistance as compared with the attraction is 22 to 26; the difference (4°) being the available force upon which the pulsations of the armature are dependant. When the circuit is broken the battery gains strength, and when closed loses in proportion. We close the circuit now, and the armature is attracted, the platinum points connect, but in "no time" the renewed strength is exhausted, and back it goes. We say that the reason why the Relay does not respond to the key, is because the attraction in excess of the resistance is not sufficient to hold the armature. Is there a remedy? Let us try Mr. Gough's plan. Without changing the last adjustment we place a spring on the other side of the armature and give it strength in opposition to the other of 17°. What is the result? Why, we have thus reduced the resistance 17°, and have a comparison of 5° resistance to 26° attraction. It's a success!

H.

◆

When the Russian American telegraph is completed the following feat is possible: A telegram from Alaska for New York, leaving Sitka, say at 6:40 on Monday morning, would be received at Nicoleaf, Siberia, at six minutes past one Tuesday morning; at St. Petersburg, Russia, at three minutes past six Monday evening; at London twenty-two minutes past four Monday afternoon; and at New York forty-six minutes past eleven Monday forenoon. Thus, allowing twenty minutes for each re-transmission, a message may start on the morning of one day, to be received and transmitted the next day, again received and sent on the afternoon of the day it starts, and finally reaches its destination on the forenoon of the first day, the whole taking place in one hour's time.—*Railroad Gazette.*

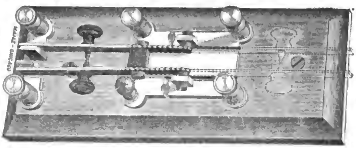
◆

Madras and Singapore Telegraph Cable.—The submersion of a submarine telegraph cable between Madras and Singapore is expected to be soon an accomplished fact. The Madras Government has directed the president of the municipal commission to have trenches dug when required from the fort to the telegraph office for the reception of the shore end of the cable, which is to be brought from England by the Great Eastern.

A NEW CUT-OUT

The form of cut-out designed for small offices, shown in the accompanying engraving, is due to Mr. E. Gray, of the firm of Gray & Barton of Chicago. As shown in the cut, there are two binding posts for the line wires, and two for the instrument wires, with a third for a ground wire. From the line binding post, extend plates, to which are hinged two brass springs which are insulated from each other by a piece of hard rubber, and which serve to connect the line plates to the instrument posts. About half way from either end of the springs, are two brass screws terminating in platinum points, which are held firmly together where the springs are disengaged from the instrument posts. These screws are provided with rubber check nuts, which serve for handles, and prevent any danger from shocks to the operator. When the line is cut out, the springs are turned over, and remain in the position indicated in the cut, by dotted lines.

From the ground wire binding-post, a brass plate extends under the springs and between the line wire plates. A plug shown opposite the ground wire binding post, can be used to connect the line wire plates to the ground plate, but these plates are set so far from each other that there is no possibility of a ground connection, without the use of the plug. The ground plate extends on both sides of the point where the springs are hinged far enough, so that it acts as a lightning arrester, whether the instrument is cut out or in. The edges of the brass springs are notched where they come near the ground plate, to facilitate the discharge of Atmospheric electricity.



The merits of this form of cut-out are obvious. It combines in a neat and tasteful form, a Cut-out, Ground Switch, and Lightning Arrester, so combined as to prevent the possibility of either an accidental opening of the circuit, or an accidental ground connection. There are no connections made under the board, everything being out in plain sight.

The conditon of the Lightning Arrester is shown every time the instrument is cut out or in.

The instrument connections are placed so far away from those of the line, that there is no possibility of danger to the instruments where the line is cut out.

◆

MEMORIES OF THE DEAD.

JAMES LEONARD.

Marshfield, Mo., Oct. 18, 1870.

J. D. Reid—*Dear Sir:*—In noticing Booth's mention of my honored friend and tutor, Jimmie Leonard, in the Journal of the first, I was thrown into a deep, and somewhat painful, study, regarding the various changes that have occurred since I first entered the office at Frankfort, Ky., in 1856, at which place Leonard was then stationed, and from whom I received my first *impressions* of the "Morse system."

How many changes, both in men, companies, and improvements, have taken place since the "good old days of the South Western," with yourself (if memory serves me) as our valued "General Superintendent," with Dr. Green, G. L. Douglass, W. D. Reed, Wm. Tanner, and others, as Directors, at Louisville. And how few of the "old set" remain. I call to mind Fisher and the Trahues, of Nashville, George Rutherford and his "Tony," at Louisville, with Leonard, Brummell, Frank George, Cody, (now all gone,) and a host of others, whom you will remember; such as Charlie Taylor, Barth, Booth, Ed. and Tom Boyle, and last, though not least, the "Invincible" Barney Hughes, of Memphis. Also Col. J. Coleman, now Superintendent Western Union Company, who, together with myself, served as a valued member of Gen. Breckinridge's staff, during the late trouble, and who was with me on the Bluffs at Memphis during the naval fight prior to the fall of that devoted city; and who together, for the last time, grasped the hand of that prince of telegraphers, and noble-hearted Christian gentleman, Jimmie Leonard. From "H." Leonard went to the Columbus Miss., office, and after a few months of trouble and sorrow, at last found peace and quietude in the "sleep that knows no waking." Peace to his ashes! A *truer* or more generous heart never breathed the breath of life.

But I have already trespassed too far on your courtesy. I shall, if desired, occasionally give you a few reminiscences of "Telegraph Items" occurring in the good old days of "Short Circuit."

Yours truly, R. L. Russell.

◆

South American Telegraphy.—The Argentine Government has accepted a proposal for the submersion of a telegraph between the Argentine Republic and Brazil. Messrs. Clark & Co., who undertake the work, are to finish it within eighteen months from the signing of the contract. Certain exclusive privileges are secured to them for 40 years.

Two Urchins, aged 9 and 11, were fined one shilling each and costs for throwing stones at the insulators of an English telegraph line.

◆

THE DOUBLE SPRING VINDICATED.

Seeing "Knowlett up's" statement in the last Journal, permit me to say that I have tried Mr. Gough's method of putting on a slight rubber spring, to help the forward movement of the armature in bad weather. I am about three miles from the end of the wire, one way, and ninety-eight the other, and in rainy weather it has been impossible for me to adjust so as to reach the farthest office; but, since trying the forward spring, I have been able to reach the farthest office in the worst weather, and, at the same time, hear my own writing perfectly plain. Now, if "*Knowlett up*" *knows* that the spring will not work well, let me say that *I know it will*, as I have had one on my relay for at least two weeks, and in the storm of Thursday, the 20th of October, it was impossible for me to adjust so as to get the office fifty miles off, and at the same time get my own writing, while, with the forward spring, I could get the writing of an office sixty-six miles off, and at the same time get my own writing perfectly plain. These are positive facts, and were tried on a wire where there are twenty-five offices, and wire stretching from Springfield to Albany, a distance of at least a hundred miles, beside the relays and resistance in the offices. Now let "Knowlett up" come out and show some reason for his statements. If he does not believe these statements, let him try the forward spring, and if he has a wire that works as hard as the one I am on, he will want the help of the forward spring in fair weather as well as foul. I speak from experience, and know what I affirm. Respectfully yours,

M. O. Morgan, Operator, Mitteneaque, Mass.

H. McAleer,
F. W. Davis,
D. D. Forbes,
M. S. Roberts,
F. M. Roberts,
G. W. Roberts,
J. F. Myers,
J. Farrell,
W. O. Lewis,
W. Holmes,
C. F. Ludwig,
D. J. Ludwig,
J. B. Tree,
C. D. Hoyt,
F. A. Eyster,
A. H. Brewer,
C. A. Tinker,
J. A. Swift,
D. B. Kelly,
A. J. Lombard,
J. B. Austin,
F. C. Loomis,
E. Curran,
J. C. Noyes,
G. C. Maynard,
A. H. Caunde,
J. Feary,
W. S. Thompson,
E. Chapman,
S. A. Jessup,
C. D. Shivler,
D. McDonald,
W. H. Hoyt,
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C. S. H. Small,
H. A. Clute,
W. D. Sargeant,
E. C. Cockey,
E. Rider,
R. S. Raymond,
W. F. Muchmore,
C. E. Case,
A. H. Adgate,
James E. Moon,
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W. H. Meake,
D. D. Mallory,
A. H. Watson,
T. Brennan,
Miss L. A. Catterfield,
Miss L. H. Snow,
R. O'Brien,
Miss E. Ward,
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Mrs. A. A. Durant,
E. H. Standiffe,
W. H. Booth,
G. F. Milliken,
J. W. Duxbury,
Miss Henrietta Dieckman,
Miss Mary C. Joseph,
John Stalcup,
A. W. Johnson,
J. B. Page,
W. E. Seward,
J. W. Brown,
T. D. Gibbons,
W. K. Applebaugh,
S. L. Gibson,
C. O. Rowe,
T. J. Whitehead,
R. M. Early,
M. L. Wilson,

William Cooke,
H. P. Dwight,
B. B. Toye,
R. Preston,
J. Houlehan,
A. Hunter,
J. P. Keene,
J. S. Hunter, 14 and 15,
C. T. Dozier,
N. B. Ross, 14 and 15,
D. C. Roberts,
F. H. Seibert,
Noah Trissall, 14,
E. B. Kelsey,
J. C. Kuebler,
John Kennan,
T. Bidwell,
E. T. Ward,
P. P. Houff,
H. D. Reynolds,
Frank Kitton,
J. H. Barker,
D. B. Hamlin,
W. P. Lucas,
Miss L E Atwater,
T R Fox,
P Fitchett,
R Wilkinson,
S. K. Rupley,
E E Hungerford,
W O Shelley,
Ira A Manley,
H R Myers,
O S Wood,
A Weller,
S Robertson,
D H Henshaw,
C H Sedgewick,
D D Mallory, 14,
J P Fowler,
C S Cutler,
N Hunker,
J W Tillinghast,
O H Lincoln,
A Ferguson,
W W Kelchner,
C E Husted,
T Henning,
J W Larish,
O C Barker,
G A Lance,
J Anderson, Jr,
A S Brown,
D A Marey,
J Cooper,
F V Gordon,
W H Slocer,
J B Slocum,
T A Laird,
O M Frost,
E V Abrahams,
Charles Thorn,
W G Serven,
H F Persen,
J Lapley,
J J Corcoran,
A J Hall,
James Hall,
A C Cheeney,
S M Hunter,
James Lytle,
H. S. Depew,
J. L. Barneker,
W Riddle, Jr.

ASSESSMENT NO. 16.

J D Reid,
J A Brenner,
Andrew Smith,
J M Crowley,
Henry Griffith,
E C Cockey
J Herrick,
John P Bignon,
J D Easterlin,
G W Bell,

Thomas M Bryan,
James Rome,
John W Brown,
Martin Barth,
C J Depew,
M L Kutterhauf,
W E Seward,
J H Townshend,
N B Ross,
W O Shelley.

◆

MARRIED.

MORGAN—BERN.—At the residence of the bride's father, in Spencer, Ind., Oct. 12, by the Rev. J. F. Culver, Mr Lew. D. Morgan, Manager W. U. Tel. Office, to Miss Julia Bern.

To which is added this significant P. S., which proves Mr. Morgan to be a happy man, and in possession of a sensible wife:

"MR. REID: Mrs. M. sends her mite ($1) to the Morse Testimonial. MANAGER."

TUCKER—WIRE.—At Hackettstown, N. J., August 17, by the Rev. F. T. Canfield, Mr. Stevens Tucker, Manager of W. U. & B. D. R. R. Telegraph Office, Belvidere, N. J., to Miss Mary M. Wire, of Hackettstown, N. J.

HANLEY—SCHAFFER.—At Kenton, Ohio, October 23, by the Rev. Mr. Foss, Mr. Daniel Hanley to Miss Ellen Schaffer, both of Ada, Ohio.

MASSEY—DAY.—At St. Mark's Episcopal Church, Malone, N. Y., Oct. 11, 1870, by the Rev. J. W. Stewart, Mr. James W. Massey, Manager W. U. Tel. Office, Lewiston, Ill., to Hannah M. Day, of Malone, N. Y.

◆

DIED.

DRISCOLL.—In Petersburg, Va., on Wednesday, October 5, at eight minutes past 12 P. M., at the residence of her father, Mr. James Doherty Mary J., wife of Mr. D. M. Driscoll, of Charleston, S. C., aged 28 years.

To Telegraph Superintendents.

We have now succeeded, for the first time, in getting a stock on hand of the following classes of Instruments, viz.:

No. 1 RELAYS

BOX RELAYS,
With and without Keys.

SOUNDING RELAYS,
With and without Keys.

No. 1 SOUNDERS,

No. 1 KEYS,

No. 2 KEYS.

We shall also have, by the first of November,

A STOCK OF REGISTERS,

And of our new style of

Single and Double Cut Outs.

Now is the time to provide yourselves with superior Instruments—superior to anything else in the market.

GRAY & BARTON.

CHICAGO, October 15th, 1870.

ATTENTION OPERATORS!

PAT. APPLIED FOR.

We would call your attention to our

Telegraph Operators Badge Pin.

It is a perfect fac-simile of the present MORSE KEY. It is made of 18 carat gold, one inch long, and makes a beautiful bosom pin, or can be worn on the vest. It is the only pin that has ever been made exclusively for Operators.

The Pin will be forwarded to any address by express C. O. D., or by mail on receipt of

PRICE, ... $5 00

All orders will be filled in the order in which they are received by addressing

HARVEY & DOW,
St. Johnsbury, Vermont.

CHARLES WILLIAMS, Jr.,
(ESTABLISHED 1856,)

109 Court Street, Boston,

Manufactures and has for sale the various kinds of

OFFICE AND MAGNET WIRES,

Including Cotton Covered, Silk, Gutta Percha, Painted, Fancy, and

DAY'S KERITE COVERED WIRE.

Also, a full assortment of

BATTERIES,

For Telegraphing, Plating, Electrotyping and Experimenting.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
November 1, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Oct. 15, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

150 Austintown, O.
47 Asbury, N. J.
381 Brinckley, Ark., re-opened.
377 Brighton, Iowa.
363 Brandon, Miss., re-opened.
400 Burton, Tex.
160 Canfield, O.
* Cannelton, Ind.
222 Clarksville, O.
457 Cherokee, Ks.
301 Forts Station, Tenn.
290 Fountain, Ind.
160 Leetonia, O.
*Middle Haddam, Conn., re-opened.

150 New Lisbon, O.
487 Plattsburg, Mo.
358 Riggston, Ill.
281 Reno, Ind.
486 Rushville, Mo.
384 Southern Car Works, La.
* South Manchester, Conn.
437 Turney, Mo.
* Tell City, Ind.
338 Vaneday, Ill.
456 Waldron, Mo.
338 Woodlawn, Ill.

NEW OFFICES OF OTHER LINES.

	Tariff for Other Lines.	*Leaves this Line.*
Cannelton, Ind.,	75 5	Louisville, Ky.
Inverway, Ont.,	same as Dresden, Ont.,	same as Dresden, Ont.
Klienburg, Ont.,	same as Berlin, Ont.,	same as Berlin, Ont.
Middle Haddam, Ct.,	30 3	Hartford, Conn.
Norwich, Ont.,	same as Berlin, Ont.,	same as Berlin, Ont.
Orangeville, Ont.,	Do.	Do.
Otterville, Ont.,	Do.	Do.
Scarboro, Ont.,	same as Toronto, Ont.,	same as Toronto, Ont.
S. Manchester, Ct.,	25 2	Hartford, Conn.
Tara, Ont.,	same as Dresden, Ont.,	same as Dresden, Ont.
Tell City, Ind.,	75 5	Louisville, Ky.
Woodbridge, Ont.,	same as Berlin, Ont.,	same as Berlin, Ont.

OFFICES CLOSED.

Allen's Pen, Tex.; Bethlehem, N. H.; Kelloggsville, N. Y., McBride's Farm, Pa.; Oxford, Ala.; Owasco, N. Y., and Allegheny Spgs., Va.

GENERAL INFORMATION.

Business for Saybrook Point, Conn. (other line office) will hereafter be sent and checked to Hartford, Conn. "Tariff for other lines" 30 and 3.

Business for Cincinnati L. M. Depot, O., will hereafter be checked to Cincinnati, O. Tariff as heretofore.

The "tariff for other lines" to Uniontown, Ky., and Shawneetown, Ill., will hereafter be 75 and 5 from Louisville, Ky.

"Check error" letters for Camden Station in Baltimore, are frequently addressed Camden Station, Md. They should always be addressed "Camden Station, Baltimore, Md."

The "tariff for other lines" from Philadelphia to Chestnut Hill, Pa., has been again changed: it is now 35 and 2.

The name of the office heretofore known as Pond Creek, Ks., has been changed to Wallace, Ks.

La Grange, Ga., in last JOURNAL is in square 257, not 275.

WILLIAM ORTON, President.

SPECIAL NOTICE.

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK,

AND

BLISS, TILLOTSON & CO.,

247 SOUTH WATER STREET, CHICAGO, ILL.,

Respectfully inform their customers, and all parties purchasing

TELEGRAPH AND ELECTRIC MATERIALS,

that they have been appointed by

SAMUEL C. BISHOP, OF NEW YORK,

General Agents for the sale of any articles manufactured by him

FOR TELEGRAPHIC AND ELECTRICAL USE.

They are now prepared to fill promptly any orders for goods on hand, or to be manufactured, at Mr. BISHOP's prices in New York.

The long experience of Mr. BISHOP in the manufacture of

PURE GUTTA PERCHA GOODS,

and the reputation he has gained and enjoys for the superior quality and perfection of manufacture of his,

SUBMARINE TELEGRAPH CAB

AND

INSULATED WIRES,

of various kinds, insulated with pure Gutta Percha, renders this arrangement a very important one for our numerous patrons throughout the country, and we confidently recommend these goods e their especial notice as being fully equal, if not superior, to any other in use.

The principal articles manufactured and offered for sale are

SUBMARINE TELEGRAPH CABLES,

(Any size required.)

Gutta Percha Covered Telegraph Office Wires, in great variety of and style.

Subterranean Wires, covered with Gutta Percha and Lead outside, various sizes.

Subterranean Wires with Gutta Percha and braided fibre, and Bishop's Patent Compound outside.

Subterranean Wires, with Fibre and Bishop's Patent Compound outside.

Pole Line Cordage, with Fibre and Bishop's Patent Compound outside.

Bridge's Patent Electric Cordage.

Bridge's Patent Double Covered Cordage.

BISHOP'S PATENT COMPOUND WIRE

for out-door use and office connections.

INSULATED WIRES,

with two Conductors, both plain and with braid outside, and great variety of other kinds made to order.

Cotton and Silk-Covered Wires, both twist and braided.

This arrangement with Mr. BISHOP, together with our own extensive Manufactory in New York, and our great variety of Telegraph Material in stock, fully establish our claim that our stores are the depots of telegraph supplies in this country.

McKEE'S RAILROAD SIGNAL BOX.

All Signals connected with the Railroad service should be uniform, conspicuous, and ready to display at a moment's notice. Under the present system when an operator receives an order to detain a train, he has to take his flag, hunt a suitable place to stick it up, and keep running out every minute until the expected train arrives, to see that his flag or lantern don't get misplaced, or the view obstructed. More accidents occur from the proper signals not being shown than by any neglect on the part of operator or trainmen. The importance of having those Signals placed in a conspicuous position cannot be overestimated; it is the basis of all train dispatching by telegraph. This long needed improvement has been supplied in

"McKEE'S SIGNAL BOX,"

patented April 28, 1868, and February 8, 1870. This Box is in use on many roads, and all attest to its merits. Below we hand a few of the many letters we have received from railroad officials:

McKEE & CO,

GENTLEMEN: I am very happy to express the satisfaction that McKEE'S TELEGRAPH SIGNAL BOX has given since its adoption on this road, and especially when, on riding over other roads, I see how superior our system of displaying Telegraph Signals is to that practiced elsewhere.

ROBERT HARRIS,
Gen'l Sup't C. B. & Q. R. R.

MESSRS. McKEE & CO.

The SIGNAL BOX got up by Mr. William McKee has been in use on this road for the past year, and given general satisfaction. The facility with which the flag or lamp can be displayed and the operator remain beside his instruments, its safety, simplicity, and durability, recommend it as an invaluable adjunct in working a railroad, and I cheerfully attest to its merits.

CHAS. R. PEDDLE,
Gen'l Sup't Terre Haute & I. R. R.

MR. McKEE.

DEAR SIR: I will say that your SIGNAL BOX has been adopted on this line of road, and gives entire satisfaction. I do not hesitate to recommend it as the best arrangement for the protection and display of Railway Signals I have yet seen.

J. C. McMULLEN,
Gen'l Sup't Chi., Alton & St. Louis R. R.

We have many other letters of a similar character.

We are now prepared to furnish any number of BOXES on short notice and reasonable terms, or will sell rights to companies to manufacture and use on their respective roads. The attention of R. R. Telegraph Superintendents is especially called and correspondence solicited.

McKEE & CO., Neponset, Illinois.

M. A. BUELL,

MANUFACTURER OF

Telegraph Instruments and Supplies

OF ALL KINDS.

ELECTRO MAGNETO MACHINES,
SURVEYORS AND MEDICAL INSTRUMENTS

NEATLY REPAIRED.

SEND FOR CIRCULAR.

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ELECTRIC TELEGRAPH WORKS.

FLEMING, POTTER & CO.,

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MANUFACTURERS of every description of

TELEGRAPH INSTRUMENTS,
ELECTRICAL APPARATUS, and
RAILWAY SIGNALS, &c.

☞ Inventor's Models carefully attended to. ☜

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SHAWK & FOOTE,

Electrical Instrument Manufacturers,

AND DEALERS IN

TELEGRAPH SUPPLIES,

55 Center street, Cleveland, O.

REPAIRING NEATLY DONE.

July tf

FRANK L. POPE,

TELEGRAPHIC AND ELECTRICAL ENGINEER,

Nos. 78 and 80 Broadway, Room 48,

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$1,000 REWARD

For any case of *Blind, Bleeding or Itching PILES* that DE BING'S PILE REMEDY fails to cure. It has cured cases of 20 years' standing. Try it, and get rid of the most troublesome disease flesh is heir to. SOLD BY ALL DRUGGISTS.

Laboratory—142 Franklin-st., Baltimore, Md. June 15-1y

CHARLES WILLIAMS, Jr.

109 Court Street,

BOSTON, MASS.,

MANUFACTURER OF

TELEGRAPH INSTRUMENTS,

BATTERIES,

AND MATERIALS OF ALL KINDS.

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19 BROAD STREET AND 52 EXCHANGE PLACE,
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104 CENTRE STREET, N. Y.,

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INSTRUMENTS, BATTERIES,

AND EVERY DESCRIPTION OF TELEGRAPH SUPPLIES.

Offer the best guaranty of excellence in their profession—in their long established business—in the extent and variety of their manufacturing facilities—in the many improvements introduced by them, now almost universally adopted or imitated—and in the extent of their business, domestic and foreign, enabling them to keep pace with telegraphic progress.

They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer

CHESTER, PARTRICK & CO.,

Manufacturers and Dealers in all kinds of

TELEGRAPH INSTRUMENTS AND SUPPLIES,

38 SOUTH FOURTH STREET, PHILADELPHIA,

Now offer for sale, or will manufacture to order,

REGISTERS,

RELAYS,

KEYS,

LIGHTNING ARRESTERS,

SOUNDERS,

SWITCHES,

And every variety of Instruments now in use. Among the supplies constantly kept on hand, are the following:

Battery Materials of all kinds, Fine Wire, all sizes, Brackets, Insulators, Medical Batteries (induced or direct current), Fire and Burglar Alarms for Banking Houses and Private Residences, as well as for Cities and Towns; also Contractors for the Construction, Reconstruction and Repair of Telegraph Lines throughout the United States.

All the Standard Works on Telegraphy furnished at the lowest prices, among which is the latest work of

MODERN PRACTICE OF THE ELECTRIC TELEGRAPH,

By Frank L. Pope.

Also, Electro-Platers' Batteries and Materials, Blasting Apparatus, Cartridges and Patent Portable Machinery for the manufacture of Nitro Glycerine.

All orders executed with promptness, and satisfaction guaranteed in the quality of articles supplied.

Improved Telegraph Wire.

The attention of Telegraph Companies and Builders is invited to the Compound Steel and Copper Wire manufactured by the

AMERICAN COMPOUND TELEGRAPH WIRE COMPANY.

Agents in New York,

MESSRS. L. G. TILLOTSON & CO., No. 8 Dey street.

THIS IMPROVEMENT

has already been quite extensively introduced, and it is confidently believed, that by the natural laws of progression, is destined to supersede iron wire for Telegraphs, because of its superior working capacity under all conditions of weather.

THE WEIGHT OF THE COMPOUND WIRE

is but about one-third that of an equivalent conductor of iron, and its conducting capacity may be largely increased with but slight increase of weight. In consequence of this lightness, together with its

GREAT AND UNIFORM STRENGTH,

but one-third of the number of poles are necessary that are required in iron wire construction, thus largely improving the Insulation and combining Economy in Construction and Reconstruction, with superiority in working.

THE WINTER TESTS

have proved its durability and capacity to successfully resist breakage from sleet and wind storms, and one of the testimonials received to this effect states that during a certain severe sleet storm the Compound Wire remained intact, while a high cost Norway Iron Wire, in the same locality, and strung at the same time, was broken in several places.

Address—

AMERICAN COMPOUND TELEGRAPH WIRE COMPANY,
ALANSON CARY, Treasurer, ;
No. 234 West [illegible] street,
New York.

Agents of the Company.

To Telegraph Managers and Superintendents.

We are now making and keep on hand a style of

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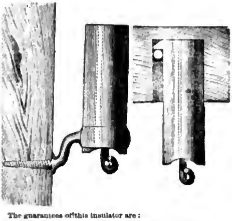

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It does not depreciate from exposure to smoke, soot and the gases from combustion to one hundredth part of the extent of ordinary insulators.

It is not injured by atmospheric discharges. It is a protection to the poles from the same effects, there not being an authenticated instance of a pole being injured where these insulators are used.

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[From the Scientific American.]

AUTOMATIC TELEGRAPHY.

BY GEORGE B. PRESCOTT.

Ever since the introduction of the electric telegraph as a means of communicating intelligence rapidly, efforts have been made, both in this country and in Europe, to perfect a system of automatic telegraphy by which the number of dispatches transmitted over each wire could be increased. Even in the early days of the electric telegraph, Professor Morse sought to perfect this system, which was embodied in the first telegraphic instrument devised by him in 1832, as it was also in the first model by which the new art was demonstrated in 1835. At that early period the automatic was deemed to be the only practical, if not practicable, method of insuring a perfect record. The details of this process are to be found in the earliest specifications and descriptions of the Morse invention in the Patent Office at Washington, and the instrumentalities are very fully described and illustrated by diagrams in Vail's earliest work on the telegraph, published in 1845. In this system metallic types were employed, which formed the dots and dashes of the Morse alphabet by short or long projections. These types, arranged or set up as a message, were placed in a row in rules or composing sticks, and were carried by clock-work mechanism under a lever which opened and closed an electric circuit, in accordance with the projections or depressions of the types. Experience soon suggested, however, that manipulation by hand with a simple lever possesses the advantages of greater simplicity and economy, and it was the system adopted for practical use.

In 1848, Alexander Bain, of Edinburgh, endeavored to solve the problem of automatic telegraphy in a different manner. He prepared the messages by a hand punch, which cut longer or shorter rectangular holes in a paper band; and these holes reproduced the Morse characters by electro-chemical means, when they were drawn underneath a rubbing contact pressing on the paper. This plan also had no practical result, for on the one hand the preparation of the perforated paper band was too troublesome and slow—the time occupied in preparing the messages for transmission being many times greater than that required for sending by the Morse system—and on the other hand, the signals could not be legibly recorded, when transmitted rapidly over long lines, in consequence of the disturbing effects of static charge.

In 1854, Messrs. Siemens and Halske, of Berlin, endeavored to remedy the defects of Bain's apparatus by means of a punching apparatus constructed with three keys. The first key, when pressed down, punched a single hole in the paper band, the second, a double hole; while each key, on returning to its normal position, pushed the paper the necessary space forwards; the third key did not punch, but served only to produce spaces between letters and words. This system was introduced on the Warsaw & St. Petersburgh line, but did not long remain in use, for the preparation of the paper was still found to be inconvenient and expensive, and a very carefully and frequently adjusted relay arrangement was required for the production of good work.

In 1857, Mr. John P. Humaston, of Connecticut, invented an instrument for perforating the paper to be employed in the transmission of messages upon the Bain plan, which it was thought by some would bring the automatic system into general use; but this apparatus, although very ingenious in design, was found too complicated, as well as too slow, for practical use—its capacity for producing the Morse characters, when worked by an expert operator, being only about one third as great as that of the ordinary hand key.

In 1858, Professor Wheatstone took out a patent in England for an automatic telegraph. He employed Bain's punched paper band and a three-keyed puncher, modified by employing double holes for representing the dash of the Morse alphabet, not next to one another, but over and under a middle row of holes. This third line of holes was produced by a special third punch which came into action on the depression of each of the three keys.

For sending messages, Wheatstone employed a peculiar and very ingenious apparatus set in motion by the turning of a handle. It was provided with three needles lying in a vertical plane, and held up by light springs. These needles were elevated and pressed against the paper by the turning of the handle. The middle needle, in rising, always met a hole and passed through it, while the two side needles were held back by the paper, when there happened to be no hole immediately above them. The pieces carrying the side needles made battery contacts when the latter went through the paper band, while the middle needle was carried forward by a mechanical arrangement, and thereby advanced the paper a space corresponding to the distance between two of the centre holes. Wheatstone at first used currents in one direction, but at a later date he employed alternate currents and polarized electro-magnets. His apparatus suffers, however, independently of technical defects, from the slowness and difficulty of preparing the messages by means of the three-keyed puncher.

In 1862, Dr. Siemens, of Berlin, again endeavored to solve the problem of successfully operating an autographic telegraph by the method first introduced by Professor Morse, employing for this purpose an electro-magnetic type transmitter, which, it is said, enabled messages to be sent with tolerable certainty over short lines with about seven times the speed of hand sending. The instrument required, however, to be worked with more than ordinary care to secure accurate results; and it was also found that the setting up of the type took too much time, and required too numerous a staff of operators to compete successfully with the hand systems.

Dr. Siemens subsequently went back to the employment of Bain's paper band, the endeavor to construct a machine for the rapid setting and distribution of metallic types having been attended with less success than he had anticipated; but he has not yet succeeded in making the system practically useful.

In 1869, Mr. George Little, of New Jersey, patented an apparatus for preparing messages for transmission by Bain's automatic system, and a wire has recently been put up between New York and Washington for the purpose of testing the value of the apparatus. The same difficulty, however, appears to be encountered by this as with all previous attempts to utilize automatic telegraphy—too much time and expense are required to prepare dispatches for transmission. This apparatus, instead of being an advance upon those which have preceded it, seems to be among the least efficient of all, and the success of automatic telegraphy is apparently as far from realization to-day as it was a quarter of a century ago.

The theory upon which most of the experimenters in automatic telegraphy have apparently proceeded is that electricity has a definite and practically instantaneous velocity, irrespective of the medium through which it is transmitted, and that all that was necessary to insure the success of the system was to provide an apparatus by which dispatches previously prepared could be rapidly transmitted and recorded by automatic machinery.

Experiments conducted upon short lines, or upon coils of wire intended to represent long lines, seemed to justify the conclusions to which the advocates of automatic telegraphy had arrived, but when attempts were made to transmit with great rapidity upon very long lines they were invariably attended with failure. Recent investigation has shown that electricity, instead of possessing an instantaneous velocity under all circumstances, is limited in its movements like all other forces in nature; and that its speed depends upon certain absolute conditions, among the principal of which are the length, size, and quality of the conductor through which it is transmitted.

In a recent series of carefully conducted experiments with the automatic system, in which chemically-prepared paper of a very sensitive nature was employed, I found that the highest rate of speed attainable through 500 miles of No. 8 iron wire did not exceed the ordinary rate of transmission by the Morse apparatus; and that the greatest speed which could be attained over a telegraph line of 250 miles in length composed of No. 8 iron wire was 100 words per minute. When the speed of the instrument was increased beyond this rate the signals were prolonged so as to run into each other and become unintelligible.

The speed of transmission increases with the square of the diameter of the wire, and diminishes with the square of its length. If a wire of the above length, but of a superior conductive capacity were employed, a proportionate increase in the rate of speed would be obtained. Thus, for example, on the compound steel and copper wire just put up between New York and Washington, which has a conductive capacity equal to a No. 5 iron wire, or about double that of a No. 9 iron wire, intelligible signals have been transmitted at the rate of 250 words per minute. By proportionately increasing, therefore, the conductive capacity of the wire, almost any degree of rapidity may be attained in the transmission of signals; but instantaneous velocity can only be attained by a conductor of infinite dimensions.

Supposing the claim was true, however, that there is no limit to the rate of speed at which dispatches can be transmitted by the automatic system over any of the lines now in use, what would be gained by its adoption? The value of the telegraph consists in its ability to furnish constant and instantaneous communication between all places in an accurate and reliable manner; and as the present systems are fully competent to meet all of these requirements, why is a change necessary or desirable? The fact that a much greater amount of matter may be transmitted in a given time, over the same number of wires, by the automatic than by the present system, offers in itself no conclusive argument in favor of a change, since there is no limit to the number of wires which may be strung between any two points in order to meet any possible increase in the traffic. The only reason, therefore, which can be adduced in favor of substituting the automatic for the hand systems is that a given amount of business may be transmitted by it at a saving in the cost of construction and maintenance of line. The superiority of the automatic system then, if it has any, consists in its greater economy. Let us see whether it is entitled to this credit.

If the expense of constructing and maintaining a sufficient number of wires to transmit a certain amount of telegraphic correspondence was the only essential element to be considered in estimating the cost of the service, then, of course, that system which could perform the service upon the smallest number of wires would be found the most economical in practice; but, unfortunately, the expense of constructing and maintaining the lines, although large, is not the greatest item in the expense of operating a telegraph, the annual expenditure for operators and clerks considerably exceeding it; and the problem, therefore, as to which system is the more economical cannot be properly solved, unless all the items of expenditure involved in the transmission of a dispatch are duly considered.

In transmitting messages by the systems now in use, no previous preparation of the dispatches is required. The copy as it is written by the customer, is placed upon the operator's table and transmitted by the Phelps printing instrument at from 2,500 to 3,000 words per hour, and simultaneously printed in plain Roman letters at the receiving station ready for delivery.

The automatic system, on the contrary, requires that the messages be previously prepared for transmission, either by a perforation of the characters representing the contents of the dispatches through a band of paper, or by setting them up in forms from movable metallic types; and after they have been thus prepared and transmitted, the record which is made at the receiving station in telegraphic characters or signals, must be subsequently translated and legibly copied upon suitable blanks before they are ready for delivery. All of this process, of course, requires time; and time is what the telegraph is especially designed to annihilate.

The best speed yet obtained during an entire day in preparing messages for transmission has never exceeded six hundred words per hour by any automatic apparatus ever devised; and as the average rate of transmission by the Phelps letter printing instrument, which is employed by the Western Union Telegraph Company between some of the principal commercial cities, is twenty-five hundred words per hour, it is evident that it would require four operators, at least, to prepare as much matter for transmission by the automatic apparatus, as one operator can send by the Phelps printing instrument; and as the messages will require translation as well as copying at the receiving station, at least as many operators would be required for this service as for the preparation of the messages, and in addition to these, one operator would be needed at each office to work the transmitting and receiving apparatus, so that no less than ten operators would be necessary to transmit as many messages per day by the automatic system as are now sent and received by two Phelps printing operators in the same time.

It is claimed by some of the advocates of automatic telegraphy that, although it requires a much larger number of persons to perform the same amount of work by that system, still as a less expensive kind of labor may be employed, the aggregate expense of each would still be in its favor; but this claim, I apprehend, is not well founded. It requires a certain amount of education and intelligence to operate any kind of telegraphic apparatus, and, generally speaking, about as much to work one kind as another. Now, I do not doubt that girls and boys of ten and twelve years of age may be found who can prepare messages for transmission by the automatic system—as it is claimed by the promoters of the enterprise—but the same prodigies could learn equally well to operate the other systems; but that all girls or boys of that age, or any considerable proportion of them, are qualified to do either, is very improbable; and I scarcely think that any argument is necessary to convince a reasonably intelligent person that the telegraphic traffic of this country cannot be safely entrusted to, nor satisfactorily performed by, children of any age, however precocious they may be.

The operators employed to prepare messages for transmission by the automatic system must at least be qualified to read ordinary manuscript writing, else they could not render the messages handed in for transmission by the public into the telegraphic characters; while those who are employed to copy the messages after they have been transmitted must be competent to write a legible hand; and this is all the education necessary to learn any other system of telegraphy. In practice, therefore, the automatic operators would require to be just as competent, and would be entitled to receive as much pay for their labor, as those of any other system. In order, however, to present the automatic system in the most favorable light possible, and to give it every advantage which its promoters claim for it, however improbable, I have in the following estimates put the rate of compensation for the services of a printing operator at one hundred per cent. above that of an automatic operator.

The cost of building a telegraph line depends, like that of any other structure, upon the value of the materials and labor employed in its construction, and differs materially in various sections of the country. But assuming that a telegraph line, with a single wire, may be built in this vicinity for three hundred dollars per mile, and additional wires put up on the same poles at one hundred dollars per mile, the following tables will show the cost of constructing and maintaining a line of telegraph between New York and Washington, together with the expense of the operators required for the transmission of a given amount of business by the automatic and the Phelps printing system of telegraphy:

COST OF A TELEGRAPH LINE BETWEEN NEW YORK AND WASHINGTON.

1 wire,	228 miles,	at	$300	per mile	$ 68,400
2 wires,	"	"	400	"	91,200
3	"	"	500	"	114,000
4	"	"	600	"	136,000
5	"	"	700	"	157,000

STATEMENT, SHOWING THE COMPARATIVE ECONOMY OF EMPLOYING THE AUTOMATIC AND PHELPS PRINTING TELEGRAPHS, UNDER THE SUPPOSITION THAT THE AUTOMATIC CAN TRANSMIT AS MUCH MATTER IN THE SAME TIME UPON ONE WIRE, AS THE PHELPS INSTRUMENT CAN SEND UPON TWO, THREE, FOUR, OR FIVE WIRES.

PHELPS' PRINTING SYSTEM.

TWO WIRES.

Interest on cost of line, $91,200 at 7 per cent	$ 6,384
Maintenance of line at 3 per cent on cost	2,736
Battery	236
Four operators at $1,200 per annum	4,800
Four grinders at $500 "	2,000
Expense per annum	$16,156

AUTOMATIC SYSTEM.

ONE WIRE.

Interest on cost of line, $68,400 at 7 per cent	$ 4,788
Maintenance of line at 3 per cent on cost	2,052
Battery	118
Ten operators to prepare messages for transmission at $600	6,000
Two operators to transmit and receive at $600	1,200
Ten operators to transmit and copy at $600	6,000
Expense per annum	$20,158

PHELPS' PRINTING SYSTEM.

THREE WIRES.

Interest on cost of line, $114,000, at 7 per cent	$ 7,980
Maintenance of line per annum at 3 per cent	3,420
Battery	354
Six operators at $1,200 per annum	7,200
Six grinders at $500 per annum	3,000
Expense per annum	$21,954

AUTOMATIC SYSTEM.

ONE WIRE.

Interest on cost of line, $68,400 at 7 per cent	$ 4,788
Maintenance of line per annum at 3 per cent	2,052
Battery	118
Fifteen operators to prepare messages at $600	9,000
Two operators to transmit and receive at $600	1,200
Fifteen operators to translate and copy	9,000
Expense per annum	$26,058

PHELPS' PRINTING SYSTEM.

FOUR WIRES.

Interest on cost of line, $136,000 at 7 per cent	$ 9,520
Maintenance of line at 3 per cent on cost	4,080
Battery per annum	472
Eight operators at $1,200 per annum	9,600
Eight grinders at $500 per annum	4,000
Expense per annum	$27,872

AUTOMATIC SYSTEM.

ONE WIRE.

Interest on cost of line, $68,400, at 7 per cent	$ 4,788
Maintenance of line per annum at 3 per cent	2,052
Battery per annum	118
Twenty operators to prepare messages at $600	12,000
Two operators to transmit and receive at $600	1,200
Twenty operators to translate and copy at $600	12,000
Expense per annum	$32,158

PHELPS' PRINTING SYSTEM.

FIVE WIRES.

Interest of cost of line, $157,000, at 7 per cent	$10,990
Maintenance of line at 3 per cent	4,710
Battery per annum	590
Ten operators at $1,200 per annum	12,000
Ten grinders at $500 per annum	5,000
Expense per annum	$33,290

AUTOMATIC SYSTEM.

ONE WIRE.

Interest on cost of line, $68,400, at 7 per cent	$ 4,788
Maintenance of line at 3 per cent on cost	2,052
Battery per annum	118
Twenty-five operators to prepare messages at $600	15,000
Two operators to transmit and receive at $600	1,200
Twenty-five operators to transmit and copy at $600	15,000
Expense per annum	$38,158

The increase in the number of automatic operators is required to keep that system up to the working capacity of each additional Phelps wire.

Thus it will be seen that, even admitting the claim that there is no limit to the amount of matter which may be transmitted by the automatic system over a single wire to be true, and also allowing that operators may be employed to work it at one half the rate of compensation which is paid to the Phelps printing operators, there is still no economy in its use, since the extra labor required in the preparation of the dispatches for transmission, as well as in the subsequent translation and copying, far exceeds the gain in the cost of constructing and maintaining the wires; and a thorough and impartial examination of the subject shows that the more the automatic system can be shown to exceed the present system in the amount of matter which can be transmitted by it, the greater would be the loss incurred in its operation; thus establishing the singular paradox that when most successful it is the greatest failure.

In the preceding exhibit, I have given the automatic system the benefit of a higher rate of speed than has ever been practically attained in the preparation of messages for transmission, while messages have been transmitted by the Phelps instrument at over 3,300 words per hour. It cannot, therefore, be justly claimed that I have failed in any respect to make as favorable a showing for the automatic system as the case will admit of, while, on the contrary, I have conceded a good many advantages to which it is not entitled.

In order to attain the exceptionally high rate of speed which has been experimentally obtained upon the automatic line recently constructed between New York and Washington, the new company put up a steel and copper wire for which they paid more than three times the cost of a good iron wire suitable for the use of the systems in general use. It is evident, therefore, that even the claim for greater economy in the construction of their lines, which has been so frequently made by the advocates of that system, is not well founded.

But, leaving all other considerations out of the question, the automatic system fails in the first two great and indispensable requisites of a telegraph—continuous and instantaneous communication. Before a message can be prepared for transmission by the automatic process, it can be transmitted, copied, and placed in the messenger's hands for delivery by either of the systems now employed. No matter how good a telegraphic apparatus may be in other respects, if it fails to transmit messages promptly it is comparatively useless. The public does not care to know how many dispatches can be sent in an hour over one wire, after half a day has been consumed in preparing them for transmission. Instant and constant dispatch is what is required, and that system only will be employed which can effect it. These most essential elements of success in telegraphy are totally lacking in the automatic system, and it must, therefore, hereafter, as heretofore, prove an absolute failure for all practical purposes.

◆

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Ellis Stone,
A. Griggs,
R. H. Morris,
S. A. Howard,
O. Dodge,
A. J. Jarvis,
T. J. Tobin,
John O'Neill,
T. A. Graham,
H. E. Doolittle,
R. W. Waterman,
W. J. Logan,
F. A. Randall,
A. J. Carnahan,
E. W. Allen,
Geo. W. Snow,
Geo. G. Hadley,
W. V. Stephens,
D. A. Van Ham,
P. Collins,
L. G. Bliss,
H. W. Wynkoop,
Geo. S. Shepard,
C. E. Moody,
F. D. Adams,
D. W. Warner,
J. D. Thurston,
J. T Stephanson,
G. A. Clarke,
G. T. Williams,
C. S. Lamb,
F. A. Armstrong,
Samuel Porter,
T. J. Moore,
W. W. Cummings,
A. E. Lang,
B. Thompson,
N. Trissell,
R. W. O'Brien,
F. C. Ward,
B. Stephens,
Thomas Allen,
J. S. Scobell,
J. S. Henry,
J. P. Golden,
G. W. Baxter,
D. T. Francis,
J. E. Selden, 13, 14 and 15,
J. Babcock,
W. H. Chivvis,
A. W. Pearkes,
L. D. Morgan,
F. J. Nicholson,
J. B. Lach,
E. B. Clark,
T. S. Proctor,
W. H. Turner,
H. S. Mason, Jr.,
A. M. Young,
T. A Mayes,
James Partrick,
J. T. Elliott,
C. H. Smith,
R. F. Whedon,
G. W. Robinson,
A H. Copeland,
H. Denver,
W. J. Denver,
Jonas S. Brown,
James K. Polk,
M. E. Houseman,
T. W. Baugham,
Fred Crouse,
K. Tullis,
J. A. Costerlin,
John Grant,
G. W. Trabue,
E. J. Wilson,
N. J. Gibson,
A. H. Stuart,
H. B. Spencer,
J. A. Remley,
J. B. Morris,
J. Lanagan,
R. Cowell,
H. Pride,
E. C. Boyle,
Geo. F. Gardner,
W. C. Everingum,
J. W. Lee,
J. Fottrell,
A. Harvey,
C. C. Haskins,
S. D. Jaynes,
A. E. Myers,
C. A. Bolton,
L. P. Mattatal,
W. H. Caniff,
A. J. Stoddard,
C. A. Leib,
H. A. Tuttle,
G. J. Whitehead,
T. L. Brown,
J. J. Harrigan,
Samuel Reese,
M. Phillips,
L. C. Taylor, 14 and 15,
Chas. Selden, Jr., 14 and 15,
P. Shafer,
W. J. Lawler,
J. C. Hall,
M. C. Newman,
O. K. Newton,
C. L. Snyder,
E. C. Armstrong,
H. H. Scobell,
M Buell,
M M Towne,
C K Skinner,
A Bethrick,
L B Carver,
M O Robertson,
A S Farwell,
A W Campbell,
J B Graham,
S. Daniels,
C Dwyer,
T B Needles,
T. Hatch,
S. C. Parsons,
L. A Louis,
L W Louis,
C H Welch,
J B Louis,
B F Ely,
H S. Depew,
C G Blake, 13, 14, and 15,
J P Hynes,
J J. Fowler,
A H Patterson,
L P Crum,
F J Loesch,
H H Abrams,
F C Jackson,
J. D. McNeil,
D J Dingman,
G W Norton,
W V Duke,
W L Biggert,
C Schmidt,
S M Dunlap,
G J Goulding,
J A Cure, 14 and 15,
A Y Bates,
Geo W Lee,
Geo. Chivvis,
R. B. Lown,
C. H. Smith,
D. R. Downer,
C. D. Camp,
W. N. White,
M. A. Erwin,
John Doran,
J. A. Conley,
J. H. Purnell,
P. W. Delano,
J. H. Pearce,
Jno. Coyne,
G. W. Muttart,
F. S. Belden,
O. A Horne,
A. W. Haygood,
S. B. Gifford,
J. D. Stone,
D. L. Pike,
D. V. Ferris,
J. C. Kelly,
E. N. Taylor,
A. J. Schall,
J. A. Hard,
W. F. Carter,
C. E. Barts,
R. S. Plumley,
J. A. Manter,
J. K. Gulihur,
J. B. Parkins,
J. H. Logan,
T. P. Brown,
C. R. Fitch,
J. M. Outten,
C. C. Crow,
J. H. Pressley,
C. M. Clark,
W. Sandford,
J. A. White,
S. P. Belden,
W. J. Evans,
J. C. Campbell,
F. M. Smith,
W. Ferguson,
W. H. Champlin,
Wm. Monoghan,
P. Bruner,
J. S. Zimmerman,
D. S. Bailey,
E. W. Armstrong,
G. W. Bullock,
C H. Summers,
J. Egan,
Jacob Madara, Jr., 14 and 15,
B. P. Humphreys,
C. C. Scott,
C. A. Stuart,
A. G Chapin,
S. H. Edwards,
J. M. Marquette,
A. F. Childs,
C. H. Edwards,
D. H. Fitch,
C D Littlejohn,
H J Nichols, 14 and 15,
L G Bangs,
Martha H Bangs,
C Moran,
J B Watt,
E Reynolds,
J A Torrence,
M Dean, 14 and 15,
J B Gibson,
W H Waller,
M A Wilder,
G M Reynolds,
A J. Locke,
J Lenhart,
N D Root,
D K Smith,
J R Dowell,
E McCarthy,
J McGovern,
Geo W McGovern,
W S. Taylor,
N C Pamplin,
G R Pace,
T A Pace,
T L Crouch,
G B Gaines,
J D Alley,
G W Alley,
R M J Painter,
S. S. Thompson,
E R Howe,
Theo Carrigan,
Mrs. H M Ogle,
J. W. Crouse, 14 and 15,
H L Gransow, 14 and 15,
W H Bancroft,
A Kern,
C H Rogers,

ASSESSMENT NO. 16.

J Eagan,
J F Myers,
M C Bagley,
Miss E L Catterfield,
Miss L H Snow,
C L Chase, 14 and 15,
M. O. Morgan,
J. B. Tree,
D A Van Ham,
Chas. E Case,
T P Scully, 15 and 16,
N B Topping, 15 and 16,
J Knitties,
A S Howe,
A K Ingraham, 15 and 16,
J Mitchell, 15 and 16,
D O Dyer, 15 and 16,
J E Netherland,
J A Torrance,
S L Gibson,
F D Vandusen,
R L Guion,
W H Fessenden,
Geo C Maynard,
H C Pardon,
J M Purdy, 14, 15, 16,
G L Lang,
W H Moak,
R Cunningham,
J Merrihew,
J S. Greene,
J W Benckert,
W H Hargraves,
A A Zeigler,
D A Curl,
A P Eastlake,
S S Bogart,
A S. Brown,
D R Downer,
Geo Chivvis,
Benj Stephens,
H F Makepeace,
D B Case, 15 and 16,
F Fairchild, 15 and 16,
H L Barber, 15 and 16,
B D Hubbard, 15 and 16,
Z Hubbard, 15 and 16,
J M Fairchild, 15 and 16,
P Collins,
J F Williams, 15 and 16,
T Brennan,
F A Eyster, 15 and 16,
James Murray, 15 and 16,
A R Brewer,
A B Chandler,
F J Grace, 15 and 16,
G H Grace, 15 and 16,
W. H. Hill,
C D Hoyt,
W H Hoyt,
W H Bunyan,
H A Clute,
W D Sargeant,
O O Smith,
H L Brower,
G S Shephard,
F T Smith, 15 and 16,
S S Thompson,
R H Woodward,
J Grant,
J C Christie, 15 and 16,
J B Page,
J P Bogar,
W C Chapman, 14, 15, 16,
R S Raymond,
A S Parmelee,
C H Stancliffe,
W H Booth,
E Sammis, 15 and 16,
C A Smith,
A H Adgate,
C Reynolds,
J. Feary,
L G Bliss,
Mary E Bell,
W O Lewis,
James Farrell,
Wm Connor,
W J Dealy, 15 and 16,
W J Bodell, 15 and 16,
H D Mallory, 16,
L Reed, 15 and 16,
C E McLaen, 15 and 16,
N R Young, 15 and 16,
A J Burton, 13, 14 15, 16,
B Clark, 14, 15, 16,
W F Shiebler,
D P Livermore,
E L Thorn,
C O Rowe,
D. R. Rice, 15 and 16,
C. A. Schuster, 15 and 16,
Theo. Southard, 15 and 16,
Geo. W Moore, 15 and 16,
A. W. Gordon, 15 and 15,
A. W. York, 15 and 16,
W. Baird, 15 and 16,
A. B. Waite,
J. Beach,
H. C. Beach,
L. H. Lathrop,
A. H. Watson,
J. H. Craig, 15 and 16,
F M Smith,
W B Gill,
W Carley,
C W Reynolds,
J C Barnes,
N J Snyder, Jr,
J D Maize,
H Bentley,
J Winthrop,
H McAleer,
Foster W Davis,
James Miller,
C K Myers, 15 and 16,
J H Conrad,
R O Crowley,
E Rider,
W F Muchmore,
C P Matthews, 15 and 15,
L B Dwight, 15 and 16,
G C G Hamley, 15 and 16,
J C Sullivan, 15 and 16,
W H Stanton, 15 and 16,
C Corbett, 15 and 16,
F K Meade,
J A Wright, 15 and 16,
J T Elliott,
J Partrick,
W Stoneback,
J L Edwards, 15 and 16,
J K Calvert, 15 and 16,
C A Tinker,
J C Noyes,
E Curran,
J A Swift,
V H Kanode,
J Stalcup,
A J Lombard,
J B Austin,
B B Kelly,
F C Loomis,
G M Simmons,
G K Wood,
D J Willis,
W H Steigelmaier,
J S Brown,
T J Tobin,
J O'Neill,
E A Cool,
T A Graham,
E G T Adams,
W H Sawyer, 15 and 16,
W K Applebaugh,
Ira DeWitt, 15 and 16,
J P Kirchner, 15 and 16,
C S H Small,
Thos Dolan, 15 and 16,
A Nedison,
W O Havens,
Sophie Rogers,
A J Jarvis,
G A Redman, 15 and 16,
John Trevor, 15 and 16,
N H Riggs, 15 and 16,
K Duff, Jr, 15 and 16,
S A Howard,
C. G. Merriwether, 15 and 16
A. G. Martin, 15 and 16,
J. M. Worden, 15 and 16,
D. L. Findlay, 15 and 16,
S. J. Hoffman, 15 and 16,
E. Seloupe, 15 and 16,
H. C. Beckwith, 15 and 16,
E. D. Sandford, 15 and 16,
W. Sandford, 15 and 16,
W. Mackintosh,
J. W. Meade, 15 and 16,
John Campbell,
T. D. Gibbons.

◆

Death of Mr. E. W. Mason.—Mr. E. W. Mason died in Atlanta, Oct. 22d, of typhoid fever, after a short illness. Mr. Mason was for some years an operator in the Augusta office. His starling worth endeared him to many friends here and elsewhere who will deeply regret to hear of his unexpected death, in the 25th year of his age. He was a genial companion, generous and unselfish. May the sod rest lightly over his bosom, and may He who tempers the wind to the shorn lamb pour the balm of consolation into the crushed hearts of his immediate family circle.

[*Augusta Chronicle.*

◆

Preserving Wood.—E. Webb, New York City, —*Oct.* 25.—This comprises the combination of the products distilled from the coal-tar, such as carbolic acid, which products distilled from wood-tar, such as pyroligneous acid, in the preservation of wood. Also, chlorid of barium in combination with the products of distillation of coal-tar or with pyroligneous acid or salts thereof, or with both. Also, the method of preserving timber by forming a longitudinal chamber extending nearly from end to end of the timber to be preserved, and furnished with lateral apertures or leads through which any preservative liquid may be introduced.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,

Executive Rooms, Western Union Tel. Co.,

145 Broadway, New York.

NEW YORK, NOVEMBER 15, 1870.

Close of Volume III.

With the present issue our third volume ends. We have therefore to bid you all adieu. As we desire, however, to be remembered kindly by our readers, you will please imagine our benignant face smiling upon each of you as we shut the door. We wish you a kind good night and hope to see you all bright and expectant on the morning of December 1st, ready to renew our long and pleasant acquaintance with each other. Between now and then Thanksgiving Day intervenes. On that day may your turkey be tender and gratitude possess your hearts. We intend to have a slice off the breast, to eat it with a plenteous layer of cranberry and with a glad and grateful heart. May all of you be equally happy on that day.

Of the year now gone we may say a single word. It has had its shadows, yet has been a year of promise and advancement. The great strike of January last we regard as one of the blessings which has marked it. We believe it was needed. It gave light to all concerned as to mutual duties and rights. It showed the necessity and policy of a just, kind, firm administration. It proved, also, the evils of leaving irresponsible control in the hands of bad or ignorant men without the opportunity of information, explanation, or appeal. It proved the danger of forswearing away all right of judgment. It was a volcano which needed vent, and like all volcanoes, though for a time destructive, has increased the fertility and peace of all it shook or jostled or disturbed. The telegraphic fraternity was never more united, there never was less friction between employer and employed, there never was a more general feeling of mutual confidence than exists to-day. Whatever is the cause for this, let it be an element of gratitude as the turkey appears on the Thanksgiving board. The craft is higher and nobler and better to-day than a year ago.

And in the business of the TELEGRAPH itself, may we not claim a marked rise to greater excellence and efficiency? Messages slip over the wires in greatly enlarged volume, but with greatly enhanced ease and dexterity. The lines are better. The obstructions which so extensively prevailed by resistances in magnets, and false joints, and careless connections, have largely disappeared. Galvanometers have come on our lines as detectives, and compelled the clearing of the electric road and there is a general desire and emulation to improve. Knowledge is every where welcome and sought.

And if this be true of the working forces of the TELEGRAPH, it is equally true of the public outside. There is a growing sentiment that the administration of the TELEGRAPH is, in the main, wise, liberal and patriotic. The establishment of air line tariffs was a touch of general justice that the public mind at once accepted as the pledge of good faith in the management of so mighty a means of national convenience, intelligence and advancement. And thus the clutching hands of those who would subordinate it to governmental manipulation recedes. More and more, we believe, must it appear, in spite of all the rhetoric of the admirers of European systems, that private enterprise, stirred by emulation and competition, will most safely and most widely and most fruitfully carry out the great national enterprises of the age. Government does best when it does least. It was established to protect, not to do, and is most beneficent when the national spindles are left to her daughters, and her anvils ring only to the hammer of her sons.

Of course we must say a word of the Morse Testimonial. That movement has much more significance than the tribute to a distinguished citizen. It is a proof of an exalted civilization, of a high moral tone, of a good and large heartedness in which we greatly glory. Every dollar which has come to us has borne a smile upon it. It has come from a willing and generous heart. If we knew of a dime which had come from the pressure of authority we would send it back. In what remains to be done we believe that a like generosity and magnanimity will show itself. Four thousand dollars seems a large sum to be raised after all we have received, yet we so trust to the true soul of the craft that we propose to go right on in our work of completing the design, regardless of obstacle or risk. We cast ourselves on the manliness and womanliness of the craft of the continent, and that without a thought that we will be left to suffer for our faith.

So, good reader, good night. We have ended the days of a coronal autumn together. Let us enter with a new faith the coming December. We hope to improve the JOURNAL by increased personal care, and by the continuance and enlargement of the invaluable corps of contributors who have made the volume of the past year so interesting and useful. Our readers may expect frequent communications from Mr. Prescott, now fully installed as the Western Union Company's electrician, and to whom we have been already so much indebted for instructive and practical matter. It shall be, so far as we can make it so, an avenue of instruction, of cheerfulness, of general good fellowship. And we believe that, as we monthly reveal to anxious stockholders how mightily the business is annually developing, and how the receipts monthly augment, even though as in the present report there appears a decline, we shall find them all enjoying their recurring Thanksgiving turkeys with a profound sense of the wisdom of their investment. Amen.

◆

RESTORATION OF THE CABLE TO CUBA.

We are glad to be able to publish the following:

OFFICE OF THE INTERNATIONAL TELEGRAPH COMPANY,
No. 89 Liberty street, New York, Nov. 14, 1868.

HON. WM. ORTON, *President.*

Dear Sir: Our cable between Punta Rassa and Key West, Fla., has been repaired, and is now in working order. Do me the favor to issue orders to your offices to receive messages for Havana and points beyond, and oblige by officially notifying connecting Companies that our line is now O K to Havana and points beyond.

Yours, truly,
WM. F. SMITH, *President.*

It is the design of the Company to lay a second cable between Punta Rassa and Key West to prevent a recurrence of similar interruptions.

◆

We regret being compelled to omit all acknowledgements of money received for the Morse Fund until next number. A large quantity of other matter is also, of necessity, postponed.

◆

THE WEST INDIA CABLE.

HAVANA, Nov. 14, 1870.

Kingston, Ja., advices of the 9th report the return of the Panama and West India Company's steamer Dacia, short of coal and provisions, and with Chagres fever among the crew, four deaths having taken place. Her efforts to recover the lost cable proved unsuccessful, the weather being unfavorable. The laying of the cable to Aspinwall had been abandoned for the present. Sir Charles Bright intended to lay the cable to St. Thomas and Porto Rico and afterwards grapple for the Aspinwall line.

The break in the cable between Punta Rassa, and Key West, Fla., has been repaired and the line is now in working order to Havana and points beyond.

◆

THE route from Java to Bankok has, in reference to a telegraph connection, been surveyed and favorably reported.

◆

THE Red Sea Cable has been repaired, after much trouble and delay.

◆

THE Black Sea Cable is still broken; messages go via Russia.

◆

THE Aurora Borealis has been sadly interfering with the telegraphs in Great Britain.

◆

A MILITARY night telegraph, consisting of fusees of different colors, visible at a distance of 21 miles, has been purchased by the Prussian Government.

◆

THE cable to connect Panama with Jamaica was commenced to be laid October 24th from Aspinwall. On Friday the 28th, signals ceased, and no information of a reliable kind has since been received. Severe weather has made the work difficult and dangerous. We hope soon to announce its completion to Jamaica. Sir Charles Bright has the sympathy and good cheer of all in his arduous undertaking.

◆

THE British Board of Trade has published, for the benefit of sea-faring men, the following: A rosy sunset presages fair weather, and a bright yellowish sky in the evening indicates wind, and a pale yellow, wet weather. A neutral gray is a favorable sign in the evening, and an unfavorable one in the morning. If the forms of the clouds are soft, undefined and feathery, the weather will be fine; but if the edges are hard, sharp and well defined, it will be foul. Any deep, unusual lines bounding the clouds betoken wind or rain, while quiet and delicate tints bespeak fair weather.

OFFICIAL STATEMENT.

WESTERN UNION TELEGRAPH COMPANY.

	September. 1869.	1870.
Receipts	$669,706 79	$654,396 86
Expenses	419,729 29	434,020 03
Net Profit	$249,977 50	$220,376 83

◆

ANSWERS TO CORRESPONDENTS.

In charging for half-rate messages where the rate is fifty cents and the message has thirty-two words, do you reckon up the amount at full rate and divide by two, or should the rate be 25 and 2, which would make a difference of 11 cents. If the rate was one dollar, it would make a difference the other way of the same amount. Please decide for us and oblige.

Reckon the tariff on the message at full rates and then divide the amount by two. Half rate means one half of the full rate, whenever the full rate is 30 cents and over. No message at half rates can be sent for less than 15 cents.

Is it not absolutely necessary to have a signature to every message handed in for transmission? Can a manager demand it?

As a rule all messages should have a signature, but circumstances might arise where it would not be improper to send a dispatch without one. Whenever a person offers a message for transmission without a signature, he should be requested to give one, but if he declines to do so, and there is nothing in the dispatch of an objectionable character, the name of the sender may be written upon the margin of the message for identification, and the dispatch forwarded without a signature.

Of course it would be improper to send an anonymous message of a personal character which would be likely to give annoyance to the receiver, and a good deal of care and discretion should be exercised in the receipt of any such messages for transmission.

You say *all* messages must be promptly delivered whether paid or collect, and if payment is refused by the receiver to collect from the sender. *Does that include answers sent collect?* If sender refuses to pay and says: "It is an answer." Is it the Company's risk?

Answers sent collect are of two kinds, viz: those prepaid or guaranteed, at the office where the messages originally started from to which these are answers, and those which are sent without being prepaid or guaranteed. In the first place the party which sent the original message is responsible for the amount of the tolls. In the other case, the person who sends the reply is responsible for the tolls in case the receiver refuses to pay.

◆

AMERICAN INSTITUTE FAIR.

AWARD OF PREMIUMS.

For the best Electric Printing Telegraph Instruments—American Printing Telegraph Company, No. 80 Broadway, N. Y. First premium.

For Telegraph Instruments—E. A. Calahan, No. 18 New street, N. Y. First premium.

For Electrical Instruments—Chas. Williams, Jr., Boston, Mass. Honorable mention.

For improvement in Liquids for Electric Batteries—Emil Provost, No. 57 Carmine street, N. Y. Honorable mention.

For Electro-Magnetic Railway Signals—William Robinson, Petroleum Centre, Pa. Honorable mention.

For the best Electro-Magnetic House Annunciator; for the best Electro-Magnetic Protector for Bank Safes; for the best Magnetic Street Annunciator; for the best Burglar Alarm Telegraph; for the best Bank Alarm Bell; for the best case of Burglar Alarm Telegraphs, Bells, and Indicators—Edwin Holmes, No. 7 Murray street, N. Y. First premium.

◆

MARRIED.

OCHELTREE—GILLILAND.—At the residence of the bride's mother, near Van Wert, Ohio, Oct. 6th, by Rev. Wm. Claybaugh, Mr. J. M. Ocheltree, Manager W. U. Tel. Office, Homer, Ill., to Miss P. Ophelia Gilliland.

◆

DIED.

DUXBURY.—Of congestion of the brain, G. Ernest, son of J. W. and Carrie A. Duxbury, of Boston, Mass. aged 5 months and 2 days.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY.
145 Broadway, New York,
November 15, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Nov. 1, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

438 Appleton City, Mo.
322 Aberdeen Junc., Miss.
283 Auburn, Ky.
446 Barnard, Mo.
378 Barry, Ill.
Black Buttes, Wy., re-opened. Tariff same as Point of Rocks, Wy
* Big Rapids, Mich.
* Benson, Minn
428 Clinton, Mo.
* Delano, Minn.
* Darwin, Minn.
82 East Hartford, Conn.
378 East Hannibal, Ill.
120 Farnham, N. Y.
41 Fort Washington, N. Y.
327 Farmer City, Ill.
373 Frenter, La.
128 Goshen, Va
358 Griggsville, Ill
Hughes, Col., tariff same as Johnson, Col.
456 Halls, Mo.
488 Kosse, Tex.
133 Lexington, Va.
* Long Lake, Minn.
397 Moulton, Iowa.
* Milwaukee Stock Yards, Wis.
438 Montrose, Mo.
358 Maysville, Ill.
363 Madison, Miss.
457 Osage, Ks.
* Paris, Mich.
* Smith's Lake, Minn.
311 Waverly, Tenn.
* Wayzota, Minn.
* Wilmer, Minn.
333 Waynesboro, Miss.
428 Windsor, Mo.

OFFICES OPENED ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Big Rapids, Mich.,	35	2	Grand Rapids, Mich.
Benson, Minn.,	210	14	Milwaukee ck. Chicago.
Delano, "	185	12	" " "
Darwin, "	195	13	" " "
Long Lake "	180	12	" " "
Mil'kee Stock Yds., Wis.,	10	1	" " "
Paris, Mich.,	35	2	Grand Rapids, Mich.
Smith's Lake, Minn.,	190	13	Milwaukee ck. Chicago.
Wayzota, "	180	12	" " "
Wilmar, "	205	14	" " "

OFFICES CLOSED.

Johnson, Col.; Anderson, Tex.; North Conway, N. H.; Point of Rocks, Wy., and Shiloh, O.

GENERAL INFORMATION.

The name of the office heretofore known as Agate, Col., has been changed to Deer Trail, Col.

WILLIAM ORTON, President.

◆

THOMAS D. WHIPPLE, telegraph builder and repairer, and who can furnish satisfactory references, desires an engagement in the Middle or Eastern States. Address, Wentworth, N. H.

◆

THE DOUBLE SPRING.

PITTSBURGH, Nov. 7, 1870.

To the Editor of the Journal of the Telegraph.

I have read several communications about the use of an extra spring placed at the back of the armature on relay magnets. I made use of this appliance as long ago as 1854, and for several years, for the purpose of overcoming the weight of the armature spring, and thus insure the reception of "*fine* writing," not an unimportant matter in those days, as you very well know.

The results claimed for it by "Santa Fe" were never discovered.

X.

To Telegraph Superintendents.

We have now succeeded, for the first time, in getting a stock on hand of the following classes of instruments, viz.:

No. 1 RELAYS,

BOX RELAYS,
With and without Keys.

SOUNDING RELAYS,
With and without Keys.

No. 1 SOUNDERS,

No. 1 KEYS,

No. 2 KEYS.

We shall also have, by the first of November,

A STOCK OF REGISTERS,

And of our new style of

Single and Double Cut Outs.

Now is the time to provide yourselves with superior Instruments—superior to anything else in the market.

GRAY & BARTON
CHICAGO, October 15th, 1870.

ATTENTION OPERATORS!

PAT. APPLIED FOR.

We would call your attention to our

Telegraph Operators Badge Pin.

It is a perfect fac-simile of the present MORSE KEY. It is made of 18 carat gold, one inch long, and makes a beautiful bosom pin, or can be worn on the vest. It is the only pin that has ever been made exclusively for Operators.

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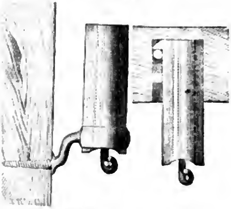

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JOURNAL OF THE TELEGRAPH.

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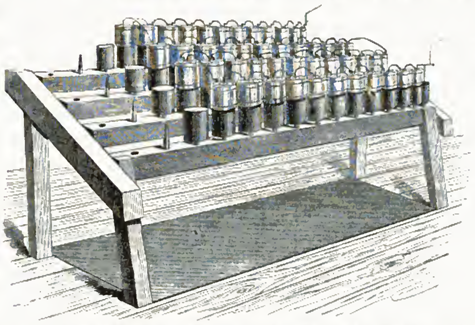
INSULATION OF BATTERIES.

There are few matters of greater importance to the practical operation of telegraph lines than the insulation of the batteries which furnish the electro-motive power for working the main circuits. Great care should invariably be taken to prevent the slightest escape of the current from the battery cells, either into each other or to the ground; and in order to effect this result, every cell should be thoroughly insulated, and the battery stands, as well as the floor of the room, kept scrupulously clean and dry.



The accompanying cut represents a battery in which each cell is completely insulated by a simple and economically arranged stand. The stand, which is intended for a battery of 60 cells, is made of 3x4 inch pine scantling, thoroughly seasoned. The length of the stand is 7 feet 9 inches, width 3 feet 3 inches, height at the back 3 feet 4 inches, and in front 2 feet. It has 15 holes in each girder, beginning 4 inches from the end. In the holes are placed oaken pins to which are attached glass insulators with wooden shields, the latter supporting the battery cells. The stand, pins and shields should be well coated with asphaltum, and the glass insulators dipped in paraffine.

The drawing represents portions of the stand, showing the holes, pins, insulators, and the battery cells in the insulators.

◆

IMPROVING THE TELEGRAPH.

[*From the New York Times.*]

Great improvements are being made in Telegraphy, as in every other science, and these improvements are the more noteworthy because they are greatly increasing the facilities for transmitting intelligence, while, at the same time, they are practically reducing the tariff on dispatches, and bringing the benefits of the telegraph within the reach of the poorer classes. Already the Western Union Telegraph Company has lessened its rates, and it is prepared to make such further reduction as the circumstances of the business shall warrant. This Company began its reduction in October, 1869, increased it the November following, and in January of the present year established what is known as the half-rate system, by which latter movement the masses of the community have been greatly benefitted. The regular reductions, in the aggregate, amount to about one half the rate of tariff that obtained two years ago; but what is called the half-rate system further reduces this amount by more than a moiety. Let us illustrate this point: The rate of tariff on a message of ten words, for instance, sent from New York to Cincinnati, in 1868, was $1 50. Owing to the reductions made from time to time since then, the regular tariff for such a dispatch now is sixty cents; but if one so chooses, he may send his dispatch according to the half-rate system for thirty cents. The only difference between the two systems is, that by the latter the dispatch is delivered at its destination at the convenience of the receiving office. The delay at the receiving office is generally short, however, as dispatches sent home in the afternoon are usually delivered the next morning to the persons for whom they are intended. In cases where there is no special urgency for the immediate delivery of a message, this system, it will be perceived, saves to the sender one-half the tariff rate.

Another improvement in the system is the establishment of a uniform tariff over the various lines throughout the country. Formerly every company established its own rates, and the progress of a message was greatly impeded by its being stopped and booked at the connecting stations between the various lines. Now there is no more difficulty in sending a message from New York to San Francisco, or other far off city, than there is in forwarding it from here to Newark, N. J., as it may be transmitted to the Pacific Coast as directly as if sent only to any neighbor in the sister State across the North River.

The length of telegraphic lines is also a matter deserving of comment. There seems to be no obstacle capable of preventing the establishment of electric connection between the remotest points. The antipodes, even, are brought into communication; mountain heights and ocean beds, let them be never so high or never so deep, are made to serve the purpose of extending communication. Lately a new line of telegraph has been put up, which brings New York City within an hour's distance from Bombay for purposes of communication. It runs from Falmouth, England, to Lisbon, in Portugal; thence through the Strait of Gibraltar and the Mediterranean to the Island of Malta; thence to Alexandria, in Egypt, and through the Red Sea to Alden, at the southern extremity of that sea, and thence across the Arabian Sea to Bombay. By means of this line a dispatch sent from this City across the Atlantic Cable will be received in Bombay one hour from the time of sending.

The telegraph is being, also, made practically useful for other than commercial purposes. The United States Government is about to inaugurate a system whereby the existing meteorological condition, in any or all parts of the country, may be known at Washington, so that storms may be foretold with such accuracy that people may be informed almost to the very hour when they may be expected; and for this purpose it will use the telegraph. Heretofore the reports have only reached the Meteorological Observatory in Washington by mail, and for the purpose of notifying the country as to the prospective condition of the weather, were practically useless. A contract has now been entered into with the Western Union Telegraph Company, whereby reports are received three times a day from the principal points in the country, so that the meteorological condition is all the time known with certainty. The telegrams contain statements of all thermometrical and barometrical indications, the direction of the wind, &c., and furnished tri-daily to the Press, to Boards of Trade, and other organizations having an interest in them. The reports come principally from Cheyenne, Duluth, Lake City, (Fla.,) New Orleans, Omaha, St. Paul, Key West, Cleveland, Chicago, St. Louis, Detroit, Boston, Portland, (Me.,) Nashville, Cincinnati, Milwankee, Toledo, Pittsburg, New York, Buffalo, Oswego, Rochester and San Francisco, and the list will be extended as fast as circumstances may warrant.

The telegraph is not only in vogue for the purpose of transmitting messages from city to city, but is also extensively used for purposes of communication between parts of the same city, and between commercial establishments and such centres of trade as it is necessary to hear from almost continuously. Apparatus for this purpose of many kinds have been invented, and are coming into very general use. The merchant now sits in his counting-house, and is constantly being informed as to the changes in the price of gold and of stocks, as brought about by proceedings in the Stock Boards, the Gold Room and on "the street." Besides this, large manufacturing establishments, located up-town, are in telegraphic communication, by means of private wires, with down-town business offices of those establishments, and orders are transmitted from the offices to the factories, questions are asked and answered between them with promptness and facility. In many cases where partners are at branch houses of one and the same establishment, located in parts of the City distant from each other, the same means of communication are used, and converse between them is made easy. The machines generally used for this purpose are the dial machines, by means of which a person operating at one end of the line causes a needle to work around a dial-plate at the other This needle, as the circuit is opened or broken by the operator, points to letters which are on the rim of the dial at the other end of the line, and thus the message is spelled out. Mr. **Geo. M. Phelps**, the electrician of the Western Union Company, has invented a machine which is a great improvement on the dial arrangement. It is worked by pressing down small keys similar to those on a concertina, each of which answers to a certain letter in the alphabet, and is marked on the top with such letter. Keys bearing numeral designations are also worked in the same manner. This machine prints the message on a paper tape—not only on one, but on both ends of the line—so that the sender is made acquainted with the dispatch as the operation proceeds, and can correct all errors without waiting to learn from the receiver how the message reads at that end. This machine is in operation now between the Company's office, Broadway and Liberty street, and its factory in Fifty-fourth street, and works most successfully. The machines are to be gotten up at a cost of about $200 each, and will, doubtless, be brought into very general use.

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TELEGRAPHIC TROUBLES.

A TENNESSEEAN THINKS HIMSELF AN INJURED MAN.

[*From the Milwaukee Wisconsin.*]

Telegraph companies have their trials and tribulations as well as other institutions. In January last, a party away down in Milan, Tenn., sent a dispatch to his wife in this city. By some means, the dispatch never reached its destination, and last week information was received from the sender, detailing his grievances and setting forth that if the company did not at once pay damages suit would be commenced. It was claimed that by the non-receipt of the dispatch the man's wife was made sick, and for two months was confined to a sick bed here. For this, $20 a week for two months was claimed. The man himself had also suffered anguish of mind which money would not compensate for, and for this the figures were $50. If the company were willing to act humanely, and settle the matter without recourse to law, the man was willing to give a receipt in full for all damages for the sum of $150, which they must immediately forward, as he wanted the money very badly.

Procuring the necessary information relative to the dispatch, Superintendent Weller, of the Milwaukee office, looked into the matter. The man's wife was not here, but her sister was found. Mr. W. asked if the woman had been sick, and was told she had been for a short time, and that the sickness was caused by an increase in the census of the city. She had a letter from her husband every three days and felt no anxiety on his account. When asked why she did not go to her husband, the sister replied, for the simple reason that her husband sent her no money to travel with. The report was made to the Southern office.

Speaking of mistakes made by the telegraph, it could scarcely be expected that they should not occur, and they frequently do so. A Milwaukee gentleman, only a few days ago, made $3,000 by one of these telegraphic blunders, and we have no doubt he wishes they would occur frequently. Another man could not get a message through to this city from the country owing to the storm, and lost $50 by it. A few days after the same thing occurred, and this time he made $50, thus balancing the account.

◆

A NEW MORSE ALPHABET.

BY WM. BOYD, CAMBRIDGE, MASS.

A New Dot-and-Dash, or Short-and-Long, or One-Note Alphabet, *for the Electro-Magnetic Telegraph, and for a Local Telegraph by either Steam-Whistle, Air-Whistle, Musical Instrument (Bells excepted), or Light.—Respectfully proposed to the Morse Electro-Magnetic Telegraph Companies of the United States and Canada, and recommended to citizens generally for either public or private local telegraphy.*

LETTERS.

E	·	L	···—	V	··——
T	··	U	—···	K	——··
A	—	M	··—·	Q	·—·—
I	···	C	·—··	J	—·—·
O	·—	F	·——	X	·——·
N	—·	W	——·	Z	—··—
S	··—	Y	—·—	&	···—··
H	—··	P	···—·	Ch	··—···
R	·—·	G	·—···		
D	——	B	··—··		

FIGURES, ETC.

1	———	6	··——·
2	···——	7	·——··
3	——···	8	·—··—
4	··—·—	9	—··—·
5	—·—··	0	·—·—·
$	—···—	£	···—···

POINTS, ETC.

Comma	·———	Parenthesis	··—··—
Semicolon	———·	Dash	—··—··
Colon	—·——	Apostrophe	··—·—·
Period	——·—	Hyphen	·—·—··
Interrogat'n	···—·—	Emphasis(+)	··——··
Exclamat'n	—·—···	Quotation	·—···—
Irony (†)	···——·	New Parag'h	—···—·
Humor (§)	·——···	Bracket	·—··—·

(As, in printing types, dots (or periods) do not line with dashes, hyphens are here used instead.)

The English language is emphatically the language of the telegraph (as it is of commerce), and the above telegraphic alphabet claims to be a perfected and exhaustive one for the English language. The Roman letters are arranged, as to frequency of use in English according to the unphonetic or common mode of spelling, from most used to least used, and the telegraphic representatives of the same, with those of the figures and points, (as also the omitted ones mentioned in next paragraph), are composed, in lowest possible numbers, of dots and dashes (or shorts and longs), and their permuted combinations. A dot counts as *one unit;* a dash is equal in length to three dots, and therefore counts in length as *three units.*

The above tables give all the (unspaced) numbers of dots and dashes in the units *one* to *three*, and all the (unspaced) combinations of these in the units *four* to *ten* which do not contain *more than three dots in succession*—all the numbers, or rows, of dots (solely) from *four dots to ten dots* inclusive, and all the combinations of dots and dashes containing anywhere more than three successive dots, being omitted to simplify, both sending and receiving. It will be observed that the units *one* to *eight* exactly take in the letters, or alphabet proper (*one* to *seven* embrace from E to B, or the first twenty, or within one of all the most important, letters); that the *nines* exactly cover the twelve figures, &c.; and that the *tens* exactly include the sixteen points, &c.

Practical electric telegraphers could of course discard as much of the third table as, in their elliptical or abbreviated style, they do not use.

The German double letter *Ch* is introduced, from the Anglo-Continental Morse alphabet.

The braces, on the left of most of the combinations, show that, where possible, such combinations are arranged in opposite pairs, to facilitate the learning of them.

In writing and in printing, it is proposed to providentially represent the new points, Irony and Humor, the first by a dagger, and the second by a section mark, as shown above.

No attempt is here made to tell how to work the electric telegraph; but the following are some

BRIEF INSTRUCTIONS FOR LOCAL TELEGRAPHY BY STEAM-WHISTLE, AIR-WHISTLE, MUSICAL INSTRUMENT, OR LIGHT.

Steamships (naval or other), steamboats (ocean, lake, or river), revenue cutters, surveying vessels, tenders (lighthouse or other), steam tugs, steam ferry boats, deep sea sailing vessels (naval or other), coasters, whalers, sealers, fishing craft, yachts, pilot boats, life boats, coast guard boats, whale boats, men-of-war boats, lightships, lighthouses, locomotives, traction engines, portable engines, steam fire engines, mills, factories, steam works of all kinds, and any public or private company, party, or person whatever, may, by signal-whistles, with the above alphabet (in alphabetic cipher, or arbitrarily, if desired), telegraph most readily, accurately, and effectively, either to points near or points eight or more miles off, during night or day, and in foggy weather or clear. Such whistles may be either air or steam, and should have an unmixed, powerful, pleasant, and quickly acting note. When communicating by musical instrument to what, for such means, may be a considerable distance, a middle note will answer best for the telegraphing note; but when the range is short, any note will do. For an instrumental telegraph in the country, a conch shell, a tin trumpet, or an ox's horn, will be as effective as a bugle, cornet, or other costly instrument. In telegraphing by light (which can of course take place after dark only), the letters, &c., are made by short and long flashes from the covered or shaded flame of a gas burner, lamp, or candle. Capital and small letters are formed alike—the sense showing the kind intended. Count *one* to a short (or dot), and *three* to a long (or dash). Allow *three blanks* between the letters in a word; and *nine blanks* between the words in a sentence, between the sentences in a paragraph, and between the paragraphs in a dispatch. When a point occurs, consider it, for blanking purposes, as the final letter in the word preceding it; and when a new paragraph notice is required, sound it as an additional final letter (thus *before* the nine blanks, instead of *after* them, that the receiver of the dispatch may have notice and opportunity to move his pencil to a new line); but it is not to be taken down, in any manner, by the receiver.

STORM SIGNALS.

The meteorological observations for which a recent act of Congress made provision are begun, and accurate reports of the weather furnished to the people. Soon after the passage of the act instructing the Secretary of War to establish a system of storm signals, the matter was placed under the direction of Lieutenant Capron, of the Signal Corps, and a training school was opened at Fort Whipple, a mile and a half from Georgetown, D. C., where the assistants who are to take charge of the observations at the many different points were instructed in relation to their duties, and allowed to become familiar with the instruments which they have to use. A room is required which is exposed to the Northward, where the delicate instruments for measuring the force and velocity of the wind and ascertaining the condition of the atmosphere, can be handled and watched with facility. Observations will be made of the amount of the rain fall, and every phase of the atmospheric phenomena will be recorded. The observations will be made at all the stations in the country simultaneously three times each day, one at eight o'clock in the morning, one at six in the evening and one at midnight. These hours are selected partly because of the great press of business upon the telegraph lines at other hours. Other observations will be made for record.

The following memoranda, issued by the Department, gives interesting information concerning transmission and publication of the reports:

"The reports of observations are to be transmitted by telegraph. By a combination of telegraphic circuits, the reports of observations made at different points synchronously will be rapidly transmitted to the different cities at which they are to be published. The whole time required to transmit, collate, and deliver the reports will, it is hoped, not exceed one hour.

"It is intended to give the widest publicity to these reports, in order to make them useful to the greatest number. Copies of all reports will be furnished to the different papers for publication, and each report will be bulletined in the Board of Trade Rooms, Merchants' Exchanges, or other conspicuous places, immediately upon its receipt. So soon as the necessary arrangements can be had, a meteorological map, on which the changes can be noted as each report is received, will be displayed at the Board of Trade Rooms, or other business centres in each city receiving reports. Similar maps will be furnished the different scientific establishments co-operating with the department. The report will be limited at the outset to the simple statement of meteorological facts existing at the stations of observations. These facts, together with such general laws as seem to have been determined by meteorological observations hitherto made, and as may permit probable deductions to be made from the reports, will be published.

"It is not deemed advisable to attempt at the outset, further than in this way, predictions which must often be erroneous. Whenever experience has certainly determined what may be regarded for any section of country as premonitions of approaching storms, signal stations will be established as quickly as the necessary arrangements can be made, and signals will be displayed announcing the probable approach, with other information, which may be possible.

The following have been selected as the stations of observation and report to be first occupied. The list will be enlarged as the facilities granted the office may permit:

Plaister Cove, N. S.; St. John, N. B.; Portland, Me.; Boston, Mass; New Haven, Conn.; New York City, N. Y.; Philadelphia, Pa.; Baltimore, Md.; Washington, D. C.; Wilmington, N. C.; Charleston, S. C.; Augusta, Ga.; Savannah, Ga.; Lake City, Fla.; Key West, Fla.; Montgomery, Ala.; Mobile, Ala.; New Orleans, La.; Jackson, Miss.; Memphis, Tenn.; Nashville, Tenn.; Louisville, Ky.; Cincinnati, Ohio; Knoxville, Tenn.; Albany, N. Y.; Syracuse, N. Y.; Oswego, N. Y.; Rochester, N. Y.; Buffalo, N. Y.; Cleveland, Ohio; Toledo, Ohio; Detroit, Mich.; Chicago, Ill.; Indianapolis, Ind.; St. Louis, Mo.; Milwaukee, Wis.; St. Paul, Minn.; Duluth, Minn.; Omaha, Neb.; Cheyenne, Dak.; Corinne, Utah; Santa Fe, N. M.; Fort Benton, N. M.; San Francisco, Cal.

Many interesting generalizations upon the subject of the movement and extent of storms have been made hitherto. Professor Espy gives the following: Storms in the United States travel from the West toward the East. They are accompanied with a depression of the barometer near the central line of the storm. They are generally of great length from North to South, and move side foremost toward the East. Their velocity is such that they travel from the Mississippi to the Connecticut River in about twenty-four hours, and from thence to St. Johns, Newfoundland, in nearly the same time, or thirty-six miles an hour. The force of the wind is in proportion to the suddenness and greatness of the fall of the barometer.

It is expected that with the aid of these observations it will be possible to warn the people of the East of the approach of Westerly storms before they reach the Mississippi River. The fact that in the North temperate zone storms almost invariably come from some Westerly point, and follow an Easterly course, renders the application of storm warnings in the United States of more immediate utility than in Europe, where the principal points, being on the Eastern coast, are first affected by the storm.

Systems of storm warnings have been in existence in Europe for several years. The first cautionary or storm-warning signals were made in England in February, 1861, and in August of the same year published forecasts of the weather were tried with such success that, by the Spring of 1862 sufficient experience had been gained to justify the adoption of the system still in use.

The value of the forecasts given is shown in a statement made by General Sabine to the board of trade. He says that he had examined the warnings given during the two years ending 31st of March, 1865, and found that in the first year fifty per cent., and in the second year seventy-three per cent. were right. Warnings of storms were sent by Admiral Fitzroy to the North and West coasts of France, and from comparison with the records for the two Winters of 1864-65 and 1865-66, it appears that of one hundred warnings sent during the first of these Winters seventy-one were realized, and during the second Winter seventy-six; and out of one hundred storms which occurred, eighty-nine were signalled during the first Winter, and ninety-four during the second Winter.

◆

SPLITTING THE CURRENT.

Springfield, Ill., Nov. 12, 1870.

Mr. Editor: Let me send you a plan of working in bad weather that I have successfully practiced for years:

When the current is unusually heavy, take a second relay, and *without* in any way or manner disconnecting or interfering with the regular relay, pass wires from the regular relay to the second relay.

The effect will be the *spreading* or dividing of the line current upon the two relays, on the quantity plan. The magnetic current will be reduced one-half (the line resistance ditto) if the relays be equal, bringing it down apparently to its usual strength in good weather, and thus making adjustment easy and controlable. The outer relay may be adjusted for the distant office, which, the operator observing, will enable him to adjust the regular relay to his own writing, and yet promptly know when the distant man breaks.

For curiosity, try at the same time passing wires from the local posts of the two relays in precisely the same manner. Yours truly,

W. W. Kelchner.

◆

BATTERY POWER.

Nashville, Tenn., November 19th, 1870.

Mr. Editor:—I do not desire, and hope I will not be understood as criticising Mr. Prescott's views or theory, relative to the amount of main battery required to work our lines. I, however, desire and propose to give some practical ideas derived from experience, relative thereto.

Mr. Prescott says we may approximate the resistance of No. 9 iron wire, where joints are not soldered, at 20 ohms to the mile, and the resistance of relays at 200 ohms each. He also says that one grove cell is the maximum amount required for working through 120 ohms circuit resistance.

I propose to take the southern portion of the 8th District, with its connecting batteries, and see how Mr. Prescott's theory holds out with a practical test.

We work, out of our southern battery, 6 wires, or 1875 miles of No. 9 wire with many unsoldered joints, and at 20 ohms to the mile it gives us 37,500. We have on these circuits 81 relays, at 200 each, giving 16,200 ohms, and a total circuit resistance of 53,700 ohms. Now we must take into account batteries working in connection with us. Memphis has 50 cells, out of which he works 2,296 miles, beside his Nashville wires. Cairo has 55 cells and works 949 miles, besides his Nashville wires. Atlanta has 50 cells and works 281 miles, besides Nashville wires.

It is reasonable to suppose that the batteries at those points furnish half the fluid for these circuits, which will give us 1,763 miles of No. 9 wire and 35,260 ohms; and as we have 81 relays on 1,875 miles, it is also reasonable to presume there are as many as 65 relays on the 1763 miles beyond those stations, with a resistance of 13,000 ohms and a total circuit resistance of 48,200, and a grand total of 3,419 miles of lines, 146 relays, with a total circuit resistance of 101,900 ohms.

To be liberal I will deduct ⅓ of this resistance and it leaves 68,183⅓ ohms; now divide this by 120, the maximum, and it requires, according to Mr. Prescott, a fraction over 567 cells, whereas we have 50 at Memphis, 55 at Cairo, 50 at Atlanta, 36 at Nashville, and 14 at Henderson, Ky., making a total of 205 cells, leaving a deficiency of 362.

I know these same circuits have been worked with less battery than we have in use at present, and I also know that until recently the resistance of our relays was from 300 to 779 ohms, and if the experience of practical telegraphers are worthy of credence, our lines have worked considerably above the average.

I admit that to render the lines serviceable at all times, we need and must have more battery, but not so much as Mr. Prescott suggests. I should say, judging by my experience of the past, and taking Mr. Prescott's approximation of the resistance as correct, that for this and adjoining districts, there should be one cell for every 250 ohms resistance, which would give us 260 cells, or 55 in addition to those now in use, and with the addition properly distributed I would be willing to guarantee there would be no complaint for the want of motive power at the stations named. Truly yours, M.

ANSWERS TO CORRESPONDENTS.

Suppose three wires, of 75, 100, and 150 miles in length respectively, are supplied from one battery of 40 Grove cells, which of them will draw the most current from the battery? and will the strength of current upon each wire be as great as it would be if each of them was supplied from a separate battery of 40 cells?

The strength of current upon a wire is found by dividing the electromotive force by the resistance of the wire, relays and battery. The formula may be expressed thus $S=\frac{E}{R}$. S being the strength of current, or quantity of electricity on the wire; E the electromotive force, which is proportional to the number of cells employed; and R the sum of the resistances. It will be seen from the above that the shorter the wire the stronger will be the current upon it from a given battery, because of the lesser resistance.

If the three wires above mentioned were supplied from separate batteries of 40 cells each, the strength of current upon each would be as follows: Resistance of 75 miles of wire—1,500 ohms; resistance of 40 cups of battery, 40 ohms. Total resistance, 1,540. Calling the electromotive force 40,000, we have then $\frac{40000}{1540}=25.98$ as the strength of current. The resistance of 100 miles of wire—2,000 ohms; adding 40 for the battery, we have $\frac{40000}{2040}=19.61$ as the strength of current. The resistance of the 150 miles of wire—3,000 ohms; adding 40 for the battery, we have $\frac{40000}{3040}=13.15$ as the strength of current.

In the above cases we have assumed that the wire was iron of No. 9 gauge, having 20 ohms resistance per mile. If No 8 iron wire were used, having a resistance of 14 ohms per mile, the strength of current from the same battery would be as follows:

75 miles, $\frac{40000}{1090}=36.66$; 100 miles, $\frac{40000}{1440}=27.77$;
150 miles, $\frac{40000}{2140}=18.69$.

If No. 4 iron were used, the strength of current with the same battery would be as follows:

$\frac{40000}{640}=62.5$; $\frac{40000}{840}=47.61$; $\frac{40000}{1240}=32.25$.

When several wires are worked from one battery the problem as to the quantity of current upon each is somewhat more complicated. It is a case of branch circuits, and the question is what is the joint or combined resistance of the several branches? The following is the rule for finding this resistance:

Calling the resistance of one circuit R, and the other r, the joint resistance of any two circuits $=\frac{R\times r}{R+r}$ or the resistance equals the product divided by the sum. When the combined resistance of three or more branches is wanted, first find the joint resistance of any two of the circuits, and considering this as one resistance, combine it with the remaining one, and so on. For example, the resistance of the 75 mile wire is 1,500 ohms; the 100 mile wire, 2,000 ohms, and the 150 mile wire, 3,000 ohms. Thus we have, first, $\frac{1500\times2000}{1500+2000}=\frac{3000000}{3500}=857$; and then $\frac{857\times3000}{857+3000}=\frac{2571000}{3857}=666$, the combined or joint resistance of the three wires.

Another method of obtaining the joint resistance of several circuits is to add together their reciprocals, and the sum will be the reciprocal of their joint resistance. Thus, in the above case—

$$\text{the resistance} = \frac{1}{\frac{1}{1500}+\frac{1}{2000}+\frac{1}{3000}} = \frac{1}{.000666+.000500+.000333} = \frac{1}{.001499} = 666.$$

If now we add to this the common resistance of the battery r=40, the total resistance of the circuit will be R+r=706, and the strength of current flowing through the battery, or generated by it, will be $s=\frac{40000}{706}=56.65$. Now this strength of circuit divides itself among the twelve branches in proportion to their several conductivities (conductivity is reciprocal of resistance). Thus the 75 mile wire gets 44.46 per cent. of the 56.65—25.18. The 100 mile wire gets 33.35 per cent.—18.89. And the 150 mile wire gets 22.23 per cent = 12.58.

The following table will show the comparative strengths of current upon three wires of 75, 100, and 150 miles in length, of No. 9 iron wire, when supplied from separate batteries of 40 cells each, and when supplied from a single battery of 40 cells:

Resistance of Line.	Resistance of Line increased by 40 Battery	Conductivity of Wires.	Conductivity of Wires, each decreased by 40 ohms.	Strength of Cur'nt when supplied by separate batteries.	Strength of Cur't when supplied from one battery of 40 cells.
1500	1540	.000666	.000642	25.98	25.18
2000	2040	.000500	.000490	19.61	18.89
3000	3040	.000333	.000328	13.15	12.58

Suppose a Grove battery of 85 cells is employed to work the following wires, viz: Eight wires each 85 miles long and having respectively 7, 5, 3, 3, 4, 16, 33 and 7 relays; two wires of 200 miles in length, each having 33 and 34 relays, and two wires of 400 miles in length, each having 5 and 8 relays, what would be the strength of current upon each wire? What would be the strength of current upon each wire if they were supplied from separate batteries of 85 cells? What would be the strength of current upon each of the last four wires and the 85 mile line with 33 relays if they were worked from a single battery of 55 cells? What would be the strength of current upon the remaining wires if they were worked from a battery of 30 cells?

In order to answer the above inquiries accurately, it would be necessary to know the resistance of each wire and its relay; but assuming that the resistances of the relays are 200 ohms each, and the resistance of the wire is 20 ohms per mile, the following tables will give the required information:

TABLE A.

Number of line.	Resistance of line.	Resistance of line and relays.	Resistance of line and relays increased by 85= Battery	Conductivity of wires.	Strength of current when supplied by separate batteries of 85 cells each	Strength of current when supplied from one battery of 85 cells.
1	1700	3100	3185	.000322	26.68	21.62
2	1700	2700	2785	.000373	30.52	25.05
3	1700	2300	2385	.000434	35.64	29.37
4	1700	2300	2385	.000434	35.64	29.37
5	1700	2500	2585	.000400	32.88	26.92
6	1700	4900	4985	.000204	17.05	13.66
7	1700	8300	8385	.000121	10.13	8.16
8	1700	3100	3185	.000322	26.68	21.62
9	4000	10800	10885	.000092	7.80	6.12
10	4000	10600	10685	.000094	7.95	6.32
11	8000	9600	9685	.000104	8.77	6.98
12	8000	9000	9085	.000111	8.85	7.34

TABLE B.

Number of line.	Resistance of line.	Resistance of line and relays.	Resistance of line and relays increased by 55= Battery.	Conductivity of wires.	Strength of current when supplied by separate batteries of 55 cells	Strength of current when supplied from one battery of 55 cells.
7	1700	8300	8355	.000121	6.58	6.41
9	4000	10800	10855	.000092	5.07	4.74
10	4000	10600	10655	.000094	5.16	5.02
11	8000	9600	9655	.000104	5.69	5.58
12	8000	9000	9055	.000111	6.07	5.85

TABLE C.

Number of line.	Resistance of line.	Resistance of line and relays.	Resistance of line and relays increased by 30 = Battery.	Conductivity of wires.	Strength of current when supplied by a separate battery of 30 cells.	Strength of current when supplied from one battery of 30 cells.
1	1700	3100	3130	.000322	9.58	9.04
2	1700	2700	2730	.000373	10.98	10.44
3	1700	2300	2330	.000434	12.87	12.12
4	1700	2300	2330	.000434	12.87	12.12
5	1700	2500	2530	.000400	11.85	11.55
6	1700	4900	4930	.000204	6.09	5.67
8	1700	3100	3130	.000322	9.58	8.97

By referring to the seventh column of table A it will be seen that No. 4 wire gets nearly five times as much current from the battery of 85 cells as No. 9; and table B shows that by dividing the wires and batteries as represented, No. 9 gets only 22 per cent. less current from 55 cells than it got from 85; or, in other words, the reduction of 35 per cent. in the number of cells would under the circumstances be followed by a reduction of only 22 per cent. in the strength of current.

Table C shows that the average strength of current on the seven wires mentioned when worked from a 30 cup battery is considerably greater than upon the five longer wires when worked from the 85 cell battery.

It is evident, of course, that if the strength of current is sufficient on 7, 9, 10, 11 and 12, when worked in common with the short wires from a general battery of 85 cells as shown in table A, then it is more than is required on 1, 2, 3, 4, 5 and 8 when supplied from a general battery of 30 cells as shown in table C.

But the presence of a large quantity of electricity on a wire, or great strength of current, is not an essential element in working a telegraph line. Indeed, wires could be, and often are, supplied from powerful batteries from which other wires are worked, but which, notwithstanding the large quantity of current obtained, are unable to work during rainy weather on account of the variation in the strength of current arising from the opening and closing of the circuits on the other wires.

The amount of attractive force which is exerted upon the armature of a relay is of far less consequence in the practical working of a line than the uniformity of the force.

It is the difference or margin of force acting upon the relay at the receiving station when the key at the sending station is open and closed upon which the operator depends for his signals.

Now, suppose that during a very wet day the two stations situated at the extreme ends of wire No. 9—four hundred miles apart—were working upon a margin of 12 per cent. By reference to table A it will be seen that the strength of current upon that wire from a battery of 85 cells would be 6.12, when the keys were closed on all the wires, and 7.80 when the keys on all the other wires were opened—for by opening the other eleven wires the battery is made a special one for the remaining wire—thus the simultaneous opening and closing of all the other circuits would affect the strength of current of this one 27 per cent. while the working margin was only 12 per cent. Of course the line could not be worked under such circumstances, although when supplied from a separate battery, or even from a battery which worked a less number of wires, it would meet with no difficulty. Take, for example, the same wire as represented in table B. When all the wires working from the general battery have their circuits closed, the strength of current on No. 9 would be 4.74. When the rest were open it would be 5.07, thus showing that only a difference of 7 per cent. would exist in this case against 27 in the other.

From the above it will be seen that the enormous waste of money in working many wires of all lengths out of one battery is not the most grievous loss; but that the injurious effects upon the practical working of the wires, especially during wet weather, far outweighs it. Few persons, we apprehend, really know how much of the trouble which arises from this great evil of working so many wires from one battery is erroneously attributed to bad insulation and other causes.

Please inform me how many Words there are in the following sentence. One hundred and fifty [150]. There is a difference of opinion in regard to counting the figures.

Executive order, No. 107, reads as follows:

"When amounts are duplicated in figures, charge for the figures the same as for the words which represent them." Now, as four words are employed to represent the figures, it follows that four words should be charged for the figures, making eight words in all.

How many words are there in the following message?

Geo. Scott and Smith eleven hundred three dollars fifty-six cents [1,103 56]. Conover and Hall ten hundred sixty-two dollars and eighty-eight cents [1,062 88]. Henline fifty-six hundred and sixty-eight and twenty-six cents [5,668 26].

There are fifty-five words.

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We are obliged to lay aside a whole cart-load of challenges to "B." of Utica, Pa. A few are given to show how honored some men are. Some sent us are amusing enough.

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Rev. Asa McFarland, who died recently in Concord, N. H., received his largest marriage fee, $20, from Prof. Morse at the occasion of his first marriage. So says an exchange.

◆

The American tariff on foreign wire, it is probably well known, will be so large January 1, 1871, as to be prohibitory, exceeding 80 per cent. It is in view of this, we presume, that Messrs. Tillotson & Co., 8 Dey street, are now receiving immense quantities of English telegraph wire, preparing themselves against the constantly enlarging demands upon them for that article. Unjust as seems to us the law which makes these purchases necessary, we cannot but admire the foresight and boldness which turns a pernicious enactment to personal advantage. None deserve it more. Mr. Tillotson is now in a position to baffle those by whose agency the law was passed and make the foreign article more profitable than the home.

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We regret to learn of the death of Mr. J. D. Walsh, formerly operator at Schenectady, N. Y., under our superintendency, and who, for a few years back, has been a most successful agent for one or more insurance companies. Early in life he was a poor boy and sold apples and nuts to passengers on the trains. Meeting with an injury which disabled him from very active service, Chauncey Vibbard, Esq., put him into railroad service, where he learned to telegraph and became a regular employe of the N. Y., Albany and Buffalo Telegraph Co. Sup't A. L. Dick was one of his pupils, and singular enough, lost his position under that gentleman's command. He was faithful to a fault, and would fight to get a message off with genuine heroism. We greatly regret his death. He left his family insurance money to the amount of $42,000.

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We acknowledge receipt of a beautiful engraving, issued by *The People's Literary Companion*, published by E. C. Allen & Co., Augusta, Me., entitled "The Past, the Present, and the Future." The *Companion* is a periodical of much excellence, has an enormous circulation, and is published at the rate of 75c. per annum, which includes a fine engraving.

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Hugh Allan, Esq., President of the Montreal Telegraph Company, has just returned home from a visit to England.

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THE DOUBLE SPRING.

Santa Fe, N. M., Nov. 14, 1870.

To the Editor of the Journal of the Telegraph.

Dear Sir: I see my letter of August 26th has caused some discussion. It appears two operators, living in the oil regions of Pennsylvania, condemn without trying the little arrangement I wrote you about, with a view to facilitate the working of a line through a heavy ground connection.

Had "Knowlett Up" read my letter *carefully*, the graphic description of "Santa Fé reaching for his adjusting post," would have been spared him. I tried to write so plainly and clearly that all would understand me. If "Knowlett Up" will turn to the Journal of Sept. 15th, he will see that I said, *after* I had fixed the spring pulling the armature *towards*, "I then adjust high enough to get the writing at the furthest office on the other side of the ground connection, and I am adjusted for every office on the line. My own writing (with the same adjustment) will close the local circuit promptly and sharply." And permit me to inform these gentlemen that the letter referred to was not written from the experience of one trial of the double spring arrangement, nor yet of a dozen, but after a test of several years; and since my letter appeared in the Journal, several operators who have tried it find the arrangement to work to a charm. I also wish to inform "S.," that if he *will try it* when he reaches the point "ahr," he will *not* have "to take his finger off mighty quick," as there will be no need of putting the finger on, and he will be able to hear the operator to whom he is transmitting break, while at the same time his own writing will be recorded distinctly and firmly. I extend my hand to Mr. M. O. Morgan, and hope the little rubber spring will do him as good service as it has myself.

I have taken night and day report nearly all the time for the last seven years, and by the help of this little arrangement I think I have never lost a report, when the wire was not broken; and it has been my luck to work on very poor lines. I recollect one instance, between Davenport, Iowa, and Muscatine, the line was dragged in with some oats by a farmer, and the oats grew up over the wire two or three inches quite green before the wire was put up on the poles, yet in all that time I never missed a report, and worked easily, while Chicago, and even Davenport, had great difficulty in getting anything from me.

I forgot to mention in my former letter that this little spring arrangement will be found especially useful where press reports are transmitted from one line to another through the common repeaters, when there is a ground connection on the line receiving the report through a repeater.

And now, Mr. Editor, as "Knowlett Up" and "S." *know* this will not work, I have this proposition to make to them: that I will forfeit a month's salary to the Telegraph Company if I cannot, with the double spring arrangement, work right along with the offices on *either* side of a heavy ground connection on the *same adjustment*, they to forfeit a month's salary to the Company if I *can*; and I can get a press report with this arrangement, when, without it, they cannot get one-fourth of it. I have worked right along with the double spring, when my galvanometer showed only three degrees higher current, with the key of the distant office closed, than it did with it open.

I am, respectfully, yours,

Joseph M. Gough.

Quincy, Ill., Nov. 16, 1870.

Jas. D. Reid, Esq.—*Dear Sir:*—In regard to the controversy now going on about the "double adjusting spring" for relays, it seems to me that both sides are partly wrong and partly right.

It cannot accomplish all its champions would have us believe, nor is it the totally useless arrangement its enemies would intimate.

A moderately stout rubber spring, or wire either, placed so as to draw the armature towards the magnets, but adjusted so lightly as to act only when the armature recedes from them, certainly cannot cause it to "stick," nor change the adjustment of the backward spring, and would undoubtedly cause "firmer" writing to be received, from both distant and near offices, and perhaps on nearly the same adjustment.

It makes the effect of the old or backward spring to be at its maximum, when the armature is nearest the magnets, because the forward spring does not then act at all, or only a very little, and at its minimum when furthest from them. Then, the slightest increase of magnetism in the magnets will cause the armature to move forward, on account of the diminished strength of the backward spring which draws it away, made so by the increased strength of the forward spring. The effect of the spring becomes greater in proportion to the proximity of the armature to the magnets, and is at its maximum when the magnetism is the strongest, and while the forward spring has little or no action. That is, the forward spring comes in play only when it is needed to assist the magnets. Hence we see the necessity of a rather stout but not heavy spring for the forward movement.

In the hands of careless persons, the "double spring" arrangement will be productive of mischief, as a too strong pressure forward will effectually shut off all writing from distant offices, without a careful adjustment of the backward spring.

If a single spring could be made to accomplish all that a double one does, it would be a desideratum, and perhaps it will be done.

I have tried to make the above as clear as possible, and you can take it for what it is worth.

Yours, respectfully,

Jno. L. Janes, Operator.

Ellsworth, Kansas, Nov. 15, 1870.

J. D. Reid, Esq.—*Dear Sir:*—Please allow me to give in a little evidence in favor of Mr. Gough's Double Spring.

My relay is a very poor one, requiring constant attention in clear weather. By applying the double spring, I have no occasion to touch the adjustment from morning till night. Our circuit is 334 miles in length, and includes 18 offices. In bad weather I hear Brookville, twenty-four miles east, telling some one west to request Hugo, 310 miles west, to adjust for him. When Hugo answers, his writing comes clear and plain on the same adjustment with Brookville.

I fear Mr. "Knowlett up" is too theoretical, and will have to "let down" before this question is settled.

Yours, respectfully, J. W. S.

Yellow Springs, O., Oct. 10, 1870.

To the Editor of the Journal of the Telegraph:

Dear Sir:—Having been a watchman for fifteen years, and having learned some of the nice points in vibrating adjustment, and now been in the study of the system of Telegraphing two years, have learned some important items of vibration in the working of relay magnets.

Now the nice point in vibration is to have a balancing force, and as the force of the magnet as a balancing force is uncertain, especially in rainy weather, we apply a spring of delicate construction, same as the other, so as to balance the force of the same. Then we have an adjustment similar to that of the hair spring of a watch. This gives the lever a steady and certain motion. Now adjust the spring so that the lever will rest gently back from the poles of the magnet. Then set up the magnet as close to the armature plate as it will work freely, and you have as nearly perfect an adjustment as you will be likely to get soon. Relay thus arranged will enable operators to werk to much better advantage in the future.

Yours, truly, A. H. Cooper.

THE DOUBLE SPRING.

HOOSAC TUNNEL, MASS., Nov. 11, 1870.

MR. EDITOR:—That some do not fully understand how to adjust with the "double spring," I am convinced. If so, they would not hesitate to pronounce it good. "Knowlett Up" says: "Get the adjustment for the other end office, *then* put on a spring pulling forward." The effect would of course be the same as though he should immediately run down his relay spring, *after he had adjusted it*. Any one understanding it in this way, would *naturally* call it nonsense. Let those who wish to try it put on the spring *first*, and then adjust for the furtherest office and they will find themselves nicely adjusted for every office, and instead of getting their own writing "hard," it will be sharp and firm. I have tried it a good many times, and am fully convinced of its practicability. If the wire is pretty strong, don't spoil the relay spring by stringing it up too high, but run back the magnets a little before adjusting. The rubber band should not be drawn around the armature with the tension of a *buggy spring*, but instead only a very small tension should be given it. I give an illustration of its value: A certain "opr.," sending on an "overland cable," while it was raining very hard, concluded he would adjust high enough to be sure he was breaking no one. He had turned up the spring but a little when he was somewhat surprised to hear "A." sending to "X." still turning up. Judge his *pheelinks* when he hears "F." sending to "B.," and, giving it another hitch, hears "Q" smashing away at "D." He says had his relay admitted of higher adjustment, he is confident he should have heard more. Hearing of the "double spring" he tried it, and says it works like "Renny's Magic Oil."

Yours, "R."

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ANOTHER!

EVANS, COLORADO, Nov. 9, 1870.

DEAR JOURNAL:—In your last issue "B" claims precedence over a previous contributor, in the matter of the number of offices held and duties performed; and adds that he would like to shake hands with him who could beat him in that line, in the employ of the W. U. Tel. Co.

If "B." will call upon me, he can have that exquisite privilege, for I *beat* him by twelve: that of Tank and Windmill Watchman, Switchman, Yardmaster, Storage and Commission Merchant, Notary Public, Real Estate Agent, Supt. Sunday School, Secretary District School Board, General Solicitor of subscriptions for charitable purposes, Fancy Poultry Breeder, Medical Student, Newspaper Reporter, and will soon run for Justice of the Peace. These, remember, are in addition to the seventeen offices enumerated in "B.'s" list, such as Freight and Ticket Agent, Operator, Express Agent, &c., &c., &c.

Here's my "weary" hand, B. Shall be glad to see you, and shake hands with so able a competitor; yet you must excuse me from tapping your boots or mending your coat, as I don't get time to pursue my *old trade* since I took this station, "73."

ED. P. H.

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AN ELEVATOR TELEGRAPH.

Potter Palmer's new hotel in Chicago has all the modern improvements. The guests make their calls upon the office through copper wires terminating in an annunciator of over 200 numbers, which is the invention of Dr Hill.

But the most novel application of electricity is the elevator car for the purpose of notifying the conductor of the car when passengers wish the car to come to their floor and take them on board.

Upon each floor is placed a small key having a button, by pressing on which with the finger the passenger signals his wants to the colored gentleman who acts as conductor. These keys are all connected by wires to an indicator and bell on the car in such a manner that the pressure of the button closes a circuit and rings a bell and turns a pointer to the number corresponding to the floor from which the call proceeded. As soon as the car has reached the floor in answer to the call, the pointer returns automatically to its former position. Several calls may be made at once, but the indicator always shows which calls have been made and which have not, while the conductor has nothing to do but look at the indicator when the bell rings and take the car to the floor indicated by the pointer.

The indicator itself, and the application to the elevator is the invention of Mr. E. Gray, of Chicago.

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DIRECT TELEGRAPHING.

[*From the San Francisco Bulletin, October 24.*]

A few days since a notice was made in the local columns of the *Bulletin* of the fact that the Western Union Telegraph Company had arranged its lines so as to work directly through from San Francisco to Chicago, the circuit being 2,700 miles in length, the longest in the world. Messages have been sent on special occasions from San Francisco to New York direct; that is to say, without re-writing, but such a thing as working a line 2,700 miles long regularly, without repeating, is a thing unprecedented in practical telegraphy. The experiment, however, has proven a complete success, and the time required for transmitting messages over the wires across the continent has been materially reduced, while greater accuracy is secured, and there are fewer hands for the matter to pass through. Saturday, a private message was sent from the San Francisco office to a gentleman in Pittsburg, Pennsylvania, at 9 A. M., and at 10:10 A. M.—just one hour and ten minutes from the time it was written here—an answer was received by the gentleman who sent it. When it is considered that the message had to be re-written at Chicago, and sent to the house of the party to whom it was addressed in Pittsburg, and that no special or extraordinary effort to obtain an early reply was made, the messages going over the wires both ways in the regular course of business, the feat is really a remarkable one, and shows that the work has been about as thoroughly systematized as it could possibly be, under any circumstances whatever.—*Cin. Commercial.*

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ELECTROLYTIC INSULATION.

MESSRS. EDITORS:—In your valuable paper of October —, I read an article about electrolytic insulation, which said that "wires may be insulated from each other, under any given electromotive force by means of good conductors of electricity, so arranged as to generate an electromotive force, which opposes the escape of the current, when the latter is transmitted in a particular direction;" or in other words, the wire is so situated between metals and electrolytes, that the difference of electric tension of the wire (or of the telegraph wire and the earth) is constant.

As I understand telegraphing, the transmitting of signals consists in making the telegraph wire alternative electric and non-electric, or, in other words, introduce a current and interrupt it again.

How can the wire, insulated as described, be rendered non-electric, as in its entire length this electrolytic insulation restores every instant the electric difference?

If the one end of the wire is connected with a battery, the other end will indicate a galvanic current; but when the battery at the one end is excluded, the current on the other end will not cease, as the "electrolytic insulation" now entirely compensates the excluded battery on the other end, and the current will continue in spite of all attempts made on the one end to stop it. I wonder how electrical signals can be transmitted through such a telegraphic line.

Therefore, I think, it is quite impossible that, in the future history of this science-art, electrolytic insulation may be made to render good services.

The above is only my prejudicial opinion, and I would like to hear through your valuable paper, whether it agrees with the opinion of scientific men or not. HUGO BILGRAM.

PHILADELPHIA, PA.

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The Shanghai correspondent of the *Times* writes: "Speaking of telegraphs, we are likely soon to be connected with Europe, despite the puerile exclusiveness of the government. A Russio-Danish company is bringing down a cable from Amoor, and the China Submarine Telegraph Company promises to lay a cable to Singapore, Hongkong, and up the coast to Shanghai, in the course of a short time. To neither, I believe, would the Pekin officials allow the right of landing even the shore end of the cable. All they would consent to was the laying of one which should be *bona fide* submerged. They probably thought this would quash the project; but the expedient of hulks can be resorted to. Yet one would think they must see that no convulsion of nature has followed the erection of telegraph wires for the foreign settlement of Shanghai, where we do not wait to ask permission. Two of the large steam companies have telegraphic communications along two miles of river from between their head offices and their wharves, and the municipal council have connected the several police stations in a similar way. The wire runs through a Chinese population of some 100,000, yet I have not heard that these people, who are represented by their rulers to be so deadly opposed to telegraphs, have even remonstrated or dreampt of regarding the wire otherwise than with curiosity.

◆

THE POSTAL TELEGRAPH SYSTEM.—The city editor of the *Times* writes as follows of a marked defect in the present postal telegraph system: "Communications have been addressed during the past few months to the Post Office by mercantile firms, pointing out the great inconvenience occasionally experienced from the refusal of the telegraph stations to give receipts for messages, but thus far apparently without effect. At present any servant intrusted with a telegram may abstain from taking it to the Post Office and purloin the money, the sender remaining in ignorance of the default, while the most serious consequences may arise, since telegrams usually relate to matters in which delay is fatal. Such instances are believed already to have been numerous. A Liverpool firm, Messrs. Bell, Nott & Co., have, moreover, urged upon the authorities the vital importance, in transactions by telegraph with foreign countries, for senders to have a receipt specifying the exact time at which they are handed in for transmission, since many questions of damages from non-execution of orders and variation of market rates are always liable to be raised; but, although they suggested the remedy of extending to telegrams the system of registration at present in force for letters, by which the Post Office revenue might be materially increased, no movement of the kind appears to be contemplated.

THE PETRIFIED FERN.

[*From Public Opinion.*]

In a valley, centuries ago,
Grew a little fern leaf, green and slender,
Veining delicate and fibres tender;
Waving when the wind crept down so low;
Rushes tall, and moss, and grass grew round it,
Playful sunbeams darted in and found it,
Drops of dew stole in by night and crowned it,
But no foot of man e'er trod that way;
Earth was young, and keeping holiday.

Monster fishes swam the silent main,
Stately forests waved their giant branches,
Mountains hurled their snowy avalanches,
Mammoth creatures stalked across the plain;
Nature revelled in grand mysteries,
But the little fern was not of these,
Did not number with the hills and trees;
Only grew and waved its wild sweet way,
None came to note it day by day.

Earth, one time, put on a frolic mood,
Heaved the rocks and changed the mighty motion
Of the deep, strong currents of the ocean;
Moved the plain and shook the haughty wood,
Crushed the little fern in soft moist clay,
Covered it, and hid it safe away;
Oh! the long, long centuries since that day!
Oh, the agony! oh life's bitter cost,
Since that useless little fern was lost!

Useless? Lost? There came a thoughtful man
Searching Nature's secrets, far and deep;
From a fissure in a rocky steep
He withdrew a stone, o'er which there ran
Fairy pencillings, a quaint design,
Veinings, leafage, fibres clear and fine,
And the fern's life lay in every line!
So, I think, God hides some souls away,
Sweetly to surprise us, the last day.

◆

THE AMERICAN TELEGRAPH IN JAPAN—AN IMPERIAL OPERATOR.

The last received issue of the *Japan Weekly Mail* contains an amusing account of a trial of a field telegraph lately presented by the American Government to the "Mikado":—

"By the Mikado's desire, the apparatus was erected in the grounds of the palace, one terminus being his majesty's private study and the other the pleasure pavilion which stands in the centre of the Maple Gardens, where were assembled three princes of the blood, the prime-minister, and a host of members of the privy council, to receive and answer the imperial messages. The working of the wires was intrusted to two Japanese, and when all was ready a message arrived at the pavilion announcing the presence of the Mikado at the terminus in the study. To this announcement a most respectful message was returned, thanking his majesty for his gracious presence. Shortly after the message came, 'The emperor is highly pleased with the wonderful Western invention;' and then immediately afterwards, 'Who are in the pavilion, and what are you doing?' To this an answer was returned giving the names of those present, and saying that they were waiting with profound veneration his majesty's gracious orders. To their intense embarrassment, the answer was returned, 'Telegraph to us something amusing.' As may be imagined, this message caused the greatest consternation among the courtiers. How were they in a moment to conjure up anything that should be amusing, and, at the same time respectful? At length one privy councillor suggested: 'This day shall be memorable in the annals of the empire as that on which his majesty for the first time witnessed the working of a telegraph.' But this was instantly rejected as being not in the least amusing. At last a youthful courtier proposed, 'We all mean to get merry of the wine which we expect your majesty to give us.' This was at once received with delight, and transmitted to the palace, and to it a reply was immediately returned that they should not expect in vain, and the proceedings terminated with a message from the emperor expressing himself satisfied with the experiments, and thanking the officers who had worked the telegraph.

"At the emperor's desire, the apparatus was left standing in the grounds, in order that he might *learn to work it himself.*"

◆

SCIENCE IN 1880—THE ELECTRICAL GUN.—But the enemy's mechanics do not despair; they invent an electrical gun, of the power of 25 mitrailleuses. A single man destroys a battalion with the greatest of ease in three minutes, and at a distance of 2,500 yards. Triumph of electricity! The thirty years' war lasts a *day and a half.—Am. Artisan.*

◆

PYROTECHNIC TELEGRAPH FOR THE PRUSSIANS.—A new nocturnal military telegraph has been invented and sold to the Prussian war department. This telegraph is a pyrotechnic one, consisting of rockets of different colors, by means of which a communication can be established between two armies stationed at a distance of twenty miles from each other. Each rocket represents six words, and an order containing three hundred words can thus be conveyed by fifty rockets. The key to this telegraph, which may be altered so as to make it unintelligible to the enemy, contains all the words used in strategy and tactics.—*Am. Artizan.*

◆

TELEGRAPHIC APPARATUS—DIGNY FRERES & COMPANY.—Instead of employing the frictional contact of a pad or padded or cushioned pusher to work the disk of the receiving instruments of printing telegraphs as is usual, the disk is worked according to this invention by gearing, that is to say, by teeth on the pusher engaging with teeth on the disk. The next improvement relates to the ink vessel. An inkwell or reservoir furnished with valve and brush is used, and by turning a handle or rod the valve is opened and the ink agitated by the brush. The printing disk or the pusher may dip into the inkwell, and the disk may be raised and lowered by a screw.

◆

"SEVENTEEN BETTER!"

JEFFERSON BARRACKS, MO., Nov. 17, 1870.

To the Editor of the Journal of the Telegraph.

In the JOURNAL of Nov. 1st, I notice an article headed "A Man Holding Seventeen Offices," which invites competition. Now, Mr. B, of Utica, Pa., I see your seventeen and go you seventeen better. For the last three years I have filled all the offices you claim to hold in connection with telegraph, railroad and express, and in addition to them I am Postmaster of a Money Order Post-office, Cashier, Auditor, Bookkeeper, Receiving Clerk, Distributing Clerk, Delivery Clerk, Mailing Clerk, Clerk Stamp Department, Clerk Registered Letter Department, Superintendent Money Order Office, Issuing Clerk Money Order Office, Paying Clerk Money Order Office, Superintendent Carriers, Local Mail Agent, Mail Messenger, and Janitor of the Custom House. It aint a very good year for offices either. I may add that I perform these duties on *one leg*, having left the other at Chickamauga, Georgia. I believe in the everlasting fitness of things and the "Double Spring" of Sante Fe. If Mr. B does not *pass* on the above, I'll throw in a small job printing office of which I am proprietor, foreman, compositor, pressman, and devil. Now, G. A.

McV.

ELEVEN BETTER!

NOVEMBER 21st, 1870.

Dear Journal:—In the JOURNAL OF THE TELEGRAPH, dated Nov. 1st, I find a correspondence from Utica, Pa., signed B, who says he is holding seventeen offices, and if there is a man that fills more offices than that in the employ of the Western Union Telegraph Company, he would like to see him and shake hands with him. In reply, I can say he can have the pleasure; here I am. I reside in a country village in the state of New York, and hold twenty-eight offices. I am now in my forty-ninth year, know you well, and knew you when you was Sup't of the N. Y. C. & Buffalo line. I was an operator then; I am an operator still. Often on taking up the JOURNAL OF THE TELEGRAPH and seeing your name, am I reminded of years gone by. You and your readers may think it strange that a person could possibly perform the work of so many offices, but such is really the case. In country villages they have to do a great deal for a little pay. By systematizing my business I have been enabled to follow the different occupations herein enumerated, viz:

Manager Western Union Telegraph office, Way Operator, Night Operator, Receiving Clerk, Forwarding Clerk, Error Clerk, Agent American Merchants' Union Express Company, Money Clerk, Bookkeeper, Agent of Sewing Machines, Agent of Piano Fortes, Agent of a Life Insurance Company, Agent of four Fire Insurance Companies, Agent of Accident Insurance Company, Justice of the Peace, Owner and Manager of a Coal Yard, Bookkeeper and Collector, Hostler for Himself, Proprietor and Manager of a Drug Store, Weighmaster on Public Scales, Repairer on Telegraph line, Agent for Renting and Collection of Rents, Secretary of Cemetary Association, Treasurer of Cemetary Association, Treasurer and Receiver of Pew Rents of a Church, Reporter and Correspondent of the Press, Conveyancer and Gardener.

If any person in the employ of the Western Union Telegraph Company can beat the above, trot him out.

A. B. C.

◆

IN a few days we will be able to supply bound copies of the third volume of the JOURNAL OF THE TELEGRAPH, at two dollars and fifty cents each.

◆

WANTED.—A situation by a sound operator of five (5) years' experience. Address, C. W. JONES, Waverly, Ohio.

THE following dispatch, extensively telegraphed, is entirely erroneous:

HAVANA, Nov. 23.

Though no official notification has been given of the event by the officers of the Panama and West India Telegraph Company, there is good authority for announcing that the telegraph cable between Jamaica and Aspinwall has been laid, and that telegraphic communication with Panama is complete.

It is understood that messages of to-day's date have been forwarded from Panama to London.

◆

THE American Atlantic Telegraph Cable Company, chartered by the State of New York in 1866, and by Congress in 1867, propose to lay a cable during 1871, the terminus of which shall be in New York City. To do this $6,000,000 in twenty year gold bonds are to be issued. Holland and Russia are stated to have given this Company concessions whereby they have secured a European landing and connections.

◆

WE regret to learn of the death, on the 21st ult., of Mrs. Emily Hill, the amiable and intelligent wife of W. H. Hill, Manager of the New York Delivery Department. For the last three years Mrs. Hill has been gradually declining and now rests and is at peace. Mr. Hill has our warmest sympathy.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, DECEMBER 15, 1870.

VOLUME IV.

After so politely bidding our readers good-night as the last volume closed, and smiling so paternally as, candle in hand, we gave them our benediction at their departure, it is only proper that we should, with none the less benignity, but with a new pleasure, welcome their return. And although in these recreant days additions to the household circle are not always rejoiced at, we desire, with true fatherly instincts, that the olive plants around our table be numerous, if not fair. Already there are signs that the JOURNAL is taking a permanent place in a large and thoughtful and influential circle of readers. It has waited patiently for this, doing its duty quietly, unostentatiously, and conscientiously. It has taken no extraordinary means to win favor. It has looked forward to appreciation only after experience and industry and fuller comprehension of duty would attract and retain it.

It must be evident to all minds that the telegraph system of the United States is fast becoming more integral and ganglionic as a nerve of the great body of the national industries and life. It is less talked of, but more indispensable. It works with less eclat and surprise, but with vastly added capacity and undemonstrative adaptation. No man now gazes at the wire in the air, but he feels in his heart that his life is ubiquitous. No man nor mother now has a child so far away that it is beyond parental call, and no ship can enter a foreign port without feeling that the owner's voice may reach the quarter-deck before the halyards are loosened, or the anchor drops from the bow. The power, the presence, the ubiquity are all wonderful, yet we have ceased to wonder. It is because the telegraph, like a healthy vein, has entered the avenues of life and become a part of it. Its silent, serious, unobtrusive work, amid the vast interests which it controls, and the world-wide sympathies which it awakens, only prove its healthfulness, and demonstrate its growing affinity to that Divine power which performs its grandest ministrations more silently than the breath of the summer air.

And so the JOURNAL aims to do its work. It has no desire to flaunt a wisdom of which it claims no superior possession, but to communicate truth as it finds it. It will become more and more the channel for thoughtful minds to use as the avenue of suggestion, and the home where telegraph workers may not only learn, but laugh. When the Japanese Micado asked the other day that something amusing be sent him over the wires, he said only what makes every face smile who reads it, and proves that Japan has a heart that must soon make her cosmopolitan. So let those who send cheerful words across the continent, and those who execute its major offices, and those who ponder over its economies and figure out its dividends, rejoice in their connection with an instrumentality so grand, so needed, so human, so divine.

◆

TWO PROMINENT EVILS.

There is an evil common to all correspondence which perhaps must, to a large degree, be regarded as incurable and inevitable. Yet it may be limited, and ought to be reprobated. We refer to the obscure formation of letters in penmanship. Every one knows, who has seen a limited correspondence, that a vast number of words are written, which have to be guessed at, and that only by the aid of returning a line or two in the manuscript, and, running up to the doubtful word, as a boy does to his comrade's back in leap frog, jumping at their meaning by the momentum of the previous text. In much correspondence this obscurity may be harmless, and may provoke mirth, but when it comes to be the feature of a telegraphic message, it becomes serious and perilous. Indeed, an obscurely written message should be refused, and many are retained until the receiver has placed all the loops on the e's, the top-knots on the r's, and properly opened up the l's and h's, so as to render the language comprehensible. From such carelessness the word "*two*," by leaving the *o* open and running the *w* into it, has frequently been transmitted "*ten*," and notes desired to be protected have been protested. And so of a multitude of words. Now a large amount of this obscurity may be avoided by the simple attention to the formation of loops. Let every *e* have an eye well opened, every *l* and *h* a good wide space between the ascending and descending lines, every *o* be a distinct circle, and the writing will at once have lost much of its obscurity and perplexity. If to this were added the careful avoidance of all embellishments, the cues and pig-tails and pennants with which fancy writers bedizzen their manuscript, and an absolute simplicity of style rigidly adhered to, making the form of the printed type the guide, there would be much time saved which is now spent over an operator's desk in endeavoring to discover what messages really mean to say. The public owe this careful clarity to themselves, and in an age when more and more the whole community are being drawn to the use of the telegraph by its growing adaptation to social necessities, the teaching of writing in the common schools should be directed by an appreciation of the necessity of a style utterly simple, clear, round and unadorned. No letter should ever appear on a telegraph message, which, like the horse on the tavern sign, required beneath a hand pointing to it, with the explanation appended, "the above is a horse." And all this is as applicable to the operator as the public. The writing of some operators is enough to give a nervous man confirmed dyspepsia, and arouses a feeling of distrust in the public mind which should disappear.

The other evil is the offspring of the universal practice of sending by sound. We confess to its greater celerity and general accuracy. But this does not blind us to the fact that much of the manipulation on the lines is painfully obscure, and is only understood by prolonged acquaintance with its peculiarities. Every operator, in our judgment, should be made to learn the formation of letters so correctly that when seen on the register paper, they are at once recognizable as the letters designed. A correct letter cannot be learned or trusted by the manipulator until he has seen the effect of the manipulation on the paper. This as a general rule. Fortunately no embellishments are possible in transmission, except where a nervous girl multiplies her dots, or some enraged man adds an expletive more forcible than polite.

◆

WE welcome the communication from Nashville, headed "Battery Power." No man can aid an electrician more than he, who, by his daily service, has to work out, in practice, the problems which the most careful theorizing cannot wholly illumine. The truth does not change, but every element of it must be seen to know what and where it is. It sometimes reveals itself in some suggestive feature to an observing inexpert. So let every one state what he sees, and what, to his mind, that vision expresses. Mr. Prescott, we know, is just as anxious as we are, that no false delicacy should prevent a free, manly, thoughtful discussion of every topic of practical service which, from any source, may invite attention. The signing of a writer's name also has an excellent effect in dissipating the distance and reserve of a semi-anonymous correspondence.

◆

WE were made happy the other day in grasping the hand of Mr. Merriwether, the rotund and genial Superintendent of the 4th Southern District, who has come to enjoy a portion of his honeymoon in the noise and rattle of New York. We hope that after the moon fades, the sun may rise upon him and brighten all his future. May his shadow never be less.

◆

SIR CHARLES BRIGHT and party have met with great and unlooked for obstacles in laying the cable to Panama. Ten cable hands have died, and seven have been invalided. Three members of his staff have been prostrated by sickness. Two thousand fathoms of rope also were lost in a storm, and have to be duplicated from England. This occurred while attempting to find and remedy an electric fault, when the hawser, to which the cable was attached, got under the ship and was cut by the keel. This loss, in connection with the violence of the weather, has stopped operations on the cable to Panama. Meanwhile the steamers Titian and Suffolk, both heavily laden, will proceed to lay the cable from St. Thomas to Porto Rico and Jamaica. For this purpose Sir Charles Bright has gone to St. Thomas and the work will be immediately commenced. Now that the season of hurricanes has, we hope, passed, we anticipate a rapid completion of these important undertakings, which have enlisted a large degree of public interest, both in the West India Islands and in the United States.

THE ATLANTIC CABLES.

As we write, both of the Atlantic cables are broken, and on account of some defect in the French cable it works slowly and painfully. The connection between America and Europe is therefore of the most delicate character. Advices from Heart's Content, just received, December 1, give notice of a quiet sea and the possibility of being able to grapple the cables to-day and reunite them, which we trust they may be able to do.

◆

It has been the custom in certain quarters for some years past to decry and underrate the value of the conductors and insulators employed by the Western Union Company. While we are free to admit that all of that Company's wires and insulators are not as good as they might be, still it is equally true that none are as bad as represented, while some will compare favorably with any to be found elsewhere, and so rapidly are improvements being prosecuted that the whole vast property of the Company must soon be in the best and most permanent condition. We take great pleasure in bearing witness to the spirit of emulation exhibited by all the superintendents of the W. U. Company in improving the conductivity of the wires by removing bad joints and soldering connections, and in improving the insulation by replacing defective insulators with those of a superior quality.

In this connection we take great pleasure in referring to some recent tests of wires in Gen. Stager's Division. Two wires extending between Chicago and Detroit, 284 miles long, in a measurement of conductivity, show respectively 4,880 and 5,000 Siemen's units of resistance—being only 17.1 and 17—5 units per mile. The same wires, in a test of insulation during a heavy rain which had continued 15 hours, showed a mileage insulation of 2,377,000 and 2,081,720 units, which shows an improvement of more than one hundred per cent. over the British standard of 1,000,000 ohms per mile.

◆

See advertisement of Mr. Frey's self-closing key.

◆

Messrs. Tillotson & Co. have imported a vast amount of telegraph wire, in anticipation of the prohibitory tariff which goes into operation January 1.

◆

Messrs. Harvey & Dow, manufacturers of the Telegraphic Badge Pin, have received so many orders as to be unable to supply them as promptly as they would be glad to do. They desire us to say that by the aid of new machinery just received, after the lapse of about 10 days more, all orders will be promptly filled.

◆

It is announced by various influential papers that preparations have been made in Washington for a vigorous presentation of the Postal Telegraph Bill, and that it will be recommended by the Postmaster General in his forthcoming report. Mr. Washburne is understood to have a bill ready for Congress, and an elaborate speech, to be delivered soon after the session opens, on that topic, in which he will urge Congress to at once unite the Telegraph to the Postal service of the nation.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

Executive Office,
Western Union Telegraph Company,
146 Broadway, New York,
December 1, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Nov. 15, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

266 Adairsville, Ga.
191 Belleville, O.
340 Collierville, Tenn.
206 Chickamauga, Tenn.
190 Council Grove, Ks.
* Clove Branch Junc., N. Y.
* Dutchess Junc., N. Y.
457 Divide, Ks.
252 Eaton, Ind.
190 Emporia, Ks.
* Elyton, Ala.
21 Foxboro, Mass., Heretofore an Other Line Office.
* Flat Rock, Mich.
436 Ft. Dodge, Iowa.
* Guyandotte, W. Va.
* Hawkinsville, Ga.
11 Hampden, Me.
66 Hamburg, Pa., heretofore Other Line Office.
Howe's Cave, N. Y., tariff same as Cobleskill, N. Y.
476 Iola, Ks.
323 Lauderdale, Miss.
25 Medfield, Mass.
* Mabou, C. B.
262 Montpelier, Ind.
* Mattawan, N. Y.
98 Montague, Mass.
446 Marysville, Mo.
36 No. Pownal, Vt.
367 Nicholas, Iowa.
358 Pittsfield, Ill.
66 Pottsville, Pa., Heretofore an Other Line Office.
179 Port Crescent, Mich.
37 Ridgefield, Conn., formerly an Other Line Office.
140 Reimersburg, Pa.
448 Ritchie, Mo.
180 Rockport, O.
161 Sharpsburg Bdge, Pa.
384 Summit, Miss., re-opened.
150 Spring, Pa
363 Terry, Miss.
256 Tilton, Ga.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Clove Branch Junc., N. Y.	30	2	Fishkill, N. Y.
Dutchess Junc., N. Y.,	30	1	" "
Elyton, Ala.,	80	5	Chattanooga, Tenn.
Flat Rock, Mich.,	20	2	Huron, Mich.
Guyandotte, W. Va.,	30	2	Catlettsburg, Ky.
Hawkinsville, Ga.,	50	5	Macon, Ga.
Mabou, C. B.,	25	2	Plaister Cove, C. B.
Mattawan, N. Y.,	20	1	Fishkill, N. Y.
Meadowvale, Ont.,	same as Berlin, Ont.,		same as Berlin, Ont.
Roche's Point, Ont.,	same as Berlin, Ont.,		same as Berlin, Ont.

OFFICES CLOSED.

Laurel, Del.; E. Hampton, L. I., and Norridgewock, Me.

GENERAL INFORMATION.

Marlboro, N. H., in tariff book, page 69, should read Marlboro Depot, N. H. The office at Marlboro, (or Marlboro Village) N. H., is on other lines. Tariff as given in tariff book.

The W. U. office at Pottsville, Pa., will not be opened until December 7th.

There is a Central Station in both Va. and W. Va. Care should be taken to address messages and letters as follows:

Central Station, Doddridge Co., W. Va., Central (or Central Depot), Montgomery Co., Va.

On and after Dec. 1, offices will send and check business for Greig and Moose River, N. Y., to Pt. Leyden, N. Y. Tariff same as heretofore.

The P. O. address of Enterprise, Pa., is South West, Warren Co., Pa.

Hereafter business for Biddeford, Me., will be sent and checked to Saco, Me., at Saco rate.

The tariff to square 190 is the same as to square 466.

Emaus, Pa., in square 66, will hereafter be checked direct.

On and after January 1st, 1871, all W. U. offices, except those on Long Island, will check direct with Brooklyn, Astoria, and Fort Hamilton, L. I., adding 15 to their present rate to N. Y. Long Island offices will check direct at the same tariff now charged by them to New York. Williamsburg is a part of Brooklyn, known as the Eastern District. Business for Williamsburg and South Brooklyn will be checked to Brooklyn.

OFFICES HAVING "SPECIAL SHEET A"

Will check Pottsville and Hamburg, Pa., 25 cents more than Philadelphia or Harrisburg, whichever gives lower amount.

WILLIAM ORTON, President.

MORSE TESTIMONIAL FUND.

RECEIVED SINCE LAST ISSUE.

FROM MOTHER ENGLAND.

Albion Steel and Wire Mills,
Saville St., Sheffield, Nov. 19th, 1870.

James D. Reid, Esq.—*Dear Sir*:—We appreciate your desire to make some suitable testimonial to Prof Morse, the projector of the telegraph, to whom universal honor should be accorded. We fervently hope the subscriptions will be such as to insure the ability to put before the world such a permanent monument to his fame as in their judgment may seem appropriate.

We cordially present you with the enclosed cheque, value 25 dollars, as a token of our appreciation of the project. Wishing you every success, we are, dear sir, Yours very respectfully,

George Gray & Co.

DUNKIRK AHEAD!

This plucky little town sent the first list to the Morse Testimonial. Here she comes, again the first on the second run! Come in, little Dunk! You shall have the front seat at the inauguration.

Dunkirk, N. Y., Nov. 25th, 1870.

Mr. James D. Reid—*Dear Sir*:—Enclosed herein I hand you a draft for $12 50 to be applied as follows:

Yours, respectfully, Jno. A. Townsend.

Subscription to Morse Testimonial Fund:

Jno A Townsend, second subscription	$2 00
W H Smith, operator, "	1 00
T W Niles, " "	1 00
A K Hand, "	1 00
Jas A Hughes, messenger, second subscription	1 00
James O'Connell, "	50
C F Edwards, A and P operator	1 00
Sam J Gifford, ex-operator	1 00
Frank G Stevens, "	1 00
Hon O S Winans, ex-amateur	1 00
Jennie F Burnham, student	1 00
Fred H Starr "	1 00
	$12 50

W H Abel, Auditor, New York	$15 00

PENNSYLVANIA.

PHILADELPHIA, READING AND POTTSVILLE TELEGRAPH COMPANY.

Contributions to the Morse Testimonial Fund, by the employes connected with the lines of the Philadelphia, Reading and Pottsville Telegraph Company:

C. T. Sellers, superintendent, Reading, Penn	$5 00
H. W. Spang, assistant superintendent, Reading, Penn.	3 00
C. L. Custer, operator, Philadelphia	2 00
Jno A. Thornton, operator, Philadelphia	1 00
Wm. R. Duchant, operator, Philadelphia	1 00
R. W. Watkinson, operator, Philadelphia	1 00
G. S. McKinley, operator, Richmond	1 00
L. F Wilson, operator, Richmond	1 00
W. A. Boyd, operator, Richmond	1 00
C. H. Thomas, operator, Belmont	1 00
Geo. A. Gregg, operator, Falls	1 00
I. A. Supplee, operator, Falls	1 00
Jos. L. Quidland, operator, Conshohocken	1 00
C. J. Ramsey, operator, Conshohocken	1 00
Geo. R. Kite, operator, Norristown Locks	1 00
S G Ramsey, operator, Norristown	1 00
W. P. Betts, operator, Merion	1 00
T C Eldridge, general agent, Perkiomen Junction	1 00
O P Ludwig, operator, Perkiomen Junction	1 00
N M Ellis, general agent, Phoenixville	2 00
John Haviland, operator, Phoenixville	1 00
Wm A Gansler, operator, Phoenixville	1 00
Frank Carey, operator, Phoenixville	1 00
Miles McCarty, operator, Phoenixville	1 00
J H. Binder, operator, Royer's Ford	1 00
A Francis, operator, Royer's Ford	1 00
E T Shaw, messenger, Royer's Ford	50
I A Roeller, telegraph foreman, Pottstown	2 00
A De Haven, operator, Monocacy	2 00
J B Griesemer, operator, Monocacy	1 00
Harry A Hahn, operator, Unionville	1 00
S L Bower, operator, Birdsboro	1 00
W B Levan, operator, Exeter	1 00
Geo D Weidner, operator, Exeter	1 00
O W Stager, relief operator, Reading	2 00
F Snaeffer, relief operator, Reading	2 00
Daniel K Weidner, relief operator, Reading	2 00
Chas A Homan, relief operator, Reading	2 00
E R Adams, operator, Reading	2 00
A J Darlington, operator, Reading	1 00
D Spang, operator Reading	1 00
L Heckroth, operator, Reading	1 00
Jno J Sellers, operator, Reading	1 00
L H Griffith, operator, Reading	2 00
Jno A Root, operator, Reading	1 00

I D Knauer, operator, Reading	1 00
F P Smith, operator, Reading	1 00
Jos K Simpson, operator, Reading	1 00
Chas F Glaze, repairman, Reading	1 00
Peter J. Ryan, messenger, Reading	25
Jas J Rourke, messenger, Reading	25
S Zimmerman, operator, Mohrsville	2 00
L D Buckley, operator, Hamburg	2 00
F P Beitenman, operator, Hamburg	50
John Leddy, operator, Port Clinton	2 00
John Gately, operator, Port Clinton	1 00
P J Leddy, operator, Port Clinton	1 00
A M Kauffmann, operator, Port Clinton	1 00
Philip S Pflum, operator, Port Clinton	1 00
Abraham Seaman, operator, Port Clinton	1 00
Michael Hartman, operator, Port Clinton	25
Geo. S. Dengler, operator, Auburn	1 00
A F Stager, operator, Auburn	1 00
G B Zulich, operator, Sch'l Haven	1 00
R Reber, operator, Sch'l Haven	1 00
John H Lengel, operator, Sch'l Haven	1 00
E T Priest, operator, Mount Carbon	1 00
J S McCalla, operator, Pottsville	2 00
C M Lewis, Jr., operator, Pottsville	2 00
Samuel B Roeller, repairman, Pottsville	1 00
E P Hodgson, messenger, Pottsville	50
Joseph D Koons, operator, Palo Alto	1 00
Chas Wineland, operator, Palo Alto	1 00
C P Kelly, operator, Port Carbon	1 00
Geo H Kline, operator, Mill Creek Scales	1 00
M Reifinger, operator, St. Clair	1 00
E H Kerlin, operator, St. Clair	1 00
Frank J Simon, operator, Cressona	1 00
Albert Geary, operator, Cressona	1 00
L N Hawley, repairman, Cressona	1 00
E. Bracefield, Jr., operator, Minersville	1 00
H S Dutter, operator, Tremont	1 00
Jas F Reeser, operator, Ringgold	1 00
D Vetter, operator, Ringgold	50
F H Gartlan, operator, Tamaqua	1 00
D R Boyer, operator, Tamaqua	1 00
E A Ash, operator, Tamaqua	50
F R Carpenter, operator, E. Mah. Junction	1 00
Michael Bourke, operator, E. Mah. Tunnel	1 00
Geo. S Pflum, operator, E. Mah. Tunnel	50
Chas Clay, operator, Mahanoy City	50
L B Paxson, superintendent R R., Mahanoy Plane	1 00
Jno J Griffiths, operator, Mahanoy Plane	1 00
J H Baub, operator, Girardville	1 00
A J King, operator, Ashland	1 00
L W Bosbyshell, operator, Colorado	1 00
Leslie Griscom, operator, Wm. Penn	1 00
Walter Griscom, operator, Wm. Penn	1 00
T H Bechtel, operator, Wm. Penn	50
Jacob Dimler, operator, Wm. Penn	50
B McDermott, operator, Shenandoah City	1 00
Chas W Spear, operator, Centralia	1 00
Chas G Freck, operator, Centralia	1 00
W D Beckman, operator, Locust Summit	50
Arthur McCaig, operator, Alaska	50
D Y Gilliam, operator, Mount Carmel	1 00
M H Keylor, operator, Excelsior	50
B F Deppen, operator, Trevorton	1 00
B F Bartlet, operator, Shenandoah Colliery, No 2	1 00
Geo Armrod, operator, Girard Mammoth Colliery	2 50
Jos F Rowse, operator, Girard Mammoth Colliery	1 00
R C Heston, operator, Cuyler Colliery	1 00
C L Brennan, operator, Cuyler Colliery	1 00
M L Willard, operator, Stanhope	1 00
W S Steiner, operator, Pine Grove	50
D C Kantner, operator, Pine Grove	50
Edward M Moloney, operator, Rausch Gap	50
H H Lesher, operator, Jonestown	50
G S Wunder, operator, Sinking Spring	1 00
J C Shearer, operator, Robesonia	50
J M Bechtel, operator, Robesonia	50
T J Dotts, operator, Sheridan	50
R R Eschelman, operator, Myerstown	50
J J Becker, operator, Lebanon	1 00
W Howard Hoch, operator, Lebanon	50
B Frank Bowman, operator, Lebanon	50
Jerome W Henry, operator, Palmyra	1 00
Wm D Sands, operator, Palmyra	50
H S Longenecker, operator, Hummelstown	50
H W Spahr, operator, Hummelstown	50
E O Lingle, operator, Harrisburg	1 00
C S Lingle, operator, Harrisburg	1 00
Jno D Lingle, messenger, Harrisburg	25
H T Kauffman, operator, Ephrata	1 00
Richard Graham, ex-operator, Ephrata	1 00
I F Bomberger, operator, Lititz	1 00
Wm J Ziegler, operator, Manheim	1 00
Frank Gage, messenger, Manheim	25
H A Kinch, operator, Junction	1 00
W F Humble, operator, Lancaster	1 00
Samuel M Stape, operator, Landisville	1 00
Thos H Hambright, operator, Columbia	1 00
Mollie G. Shultz, operator, Rockville	1 00
B F Craig, operator, Rockville	50
J C Boggs, operator, Dauphin	1 00
H O Baum, operator, Dauphin	1 00
Total	$151 75

NEW YORK CITY.

We reprint the following from our last acknowledgments, it having been crowded in with another list to which it did not properly belong. It is from the managers of branch offices:

J. C. Hinchman	$5 00	F. P. Marsh	$1 00
E. S. Sprongsteen	1 00	J. B. Page	1 00
Alonzo J. Burton	1 00	H. McGonegal	1 00
B. W. Marriott	1 00	C. E. Gatter	1 00
Wm. A. Schutt	1 00	R. P. Brooks	1 00
Chas. Willis	1 00	H. L. Martin	1 00
P. H. Flynn	1 00	Wm. Grevers	1 00
Thos. Flynn	1 00	Chas. W. Pearson	1 00
Lathrop S. Eddy	1 00	Edward P. Reardon	1 00
A. G. Bates	1 00	W. A. Pease	1 00
Sam. O. Welp	1 00	A. D. V. Brown	1 00
J. W. Burnham	1 00	George Arnott	1 00
Wm H. Clark	1 00	L. Howe Clark	1 00
John M. Howe	1 00	Chas. A. Kittle	1 00
John Earle	50	P. Collins	1 00
Total			$33 00

We very heartily welcome the following note from our friends and cotemporaries of the Telegrapher. It is another gratifying evidence of the universal feeling of satisfaction with which the tribute to Prof. Morse is rendered:

OFFICE OF THE TELEGRAPHER,
NEW YORK, Nov. 7, 1870.

Mr. J. D. REID, *Chairman Morse Testimonial Committee:*

DEAR SIR: Herewith please find ten dollars, a contribution of five dollars each from the undersigned, towards the memorial statue for the venerable Prof. Morse. It gives us pleasure to contribute towards this complimentary expression of appreciation of one whose name through all time will be recognized as that of the originator of the American telegraph system. We hope that the Professor may live to witness the inauguration of this statue, which we are sure he will regard as the highest and most gratifying recognition of his distinguished attainments and services to the world.

JNO. ASHLEY, Publisher and Editor.
F. L. POPE, Associate Editor.

FROM ANOTHER OLD BOY.

EVANSVILLE, Ind., Oct. 29, 1870.

J. D. REID, *Esq., Chairman, &c.*

DEAR SIR: Here's twenty dollars, a *morsel* for the Morse Testimonial from the boys along the banks of the beautiful Ohio. They are all young and *sound* operators, who wish to be registered in the contribution circuit.

As it is easiest to go down stream, I will begin at Louisville with "Our Duke," who subscribed with the W. U. boys of L'vl office, where they dropped their *greens* in the *Boyl-ed pot.*

W. V. Duke, operator, Louisville, Ky	$1 00
W. S Hedge, repairer, Louisville, Ky	1 00
S. Raitt, operator, Brandenburg, Ky	1 00
Andrew Crawford, operator, Stephensport, Ky	1 00
James E. Friend, operator, Cloverport, Ky	1 00
Robt. S. Stringer, operator, Hawesville, Ky	1 00
James E. Stone, operator, Cannelton, Ind	1 00
Frank McAdams, operator, Tell City, Ind	1 00
J. L. Hatfield, operator, Grand View, Ind	1 00
Amos Davis, operator, Rockport, Ind	1 00
E. C. Allen, operator, Owensboro, Ind	1 00
Eugene Burks, operator, Owensboro	1 00
Wm. Sutherland, operator, Newbury, Ind	1 00
Jno. C. Oldham, chief operator, Evansville, Ind	1 00
Geo. W. Newman, operator, Evansville, Ind	1 00
Jno. H. Hedden, operator, W. U. and O. R. Henderson, Ky.	1 00
Alex. Rense, messenger, Henderson, Ky	25
Edward Kerr, operator, Uniontown, Ky	1 00
J. Willie Porter, operator, Shawneetown, Ill	1 00
N. M. Booth, second subscription	1 75
	$20 00

Please send twenty papers containing the above list to my address, C. O. D., by Adams Express, and very much oblige

Your obedient servant, &c., N. M. BOOTH.

J. Van A. Carter, Fort Bridges, Wyoming	$5 00
J. T. Webber, Brighton Iowa, opening gift	1 00

This office opened to-day, Oct. 24.

A. A. Green, Aurora, Nevada	$2 00
L. P. Walker, manager, Frazeysburg, Ohio	1 00

FROM NEW ORLEANS, LA.

DEAR SIR: The following are additional subscriptions to the Morse Testimonial. If you find the circuit too long or the escape too heavy, *we will repeat.*

Yours very sincerely,
D. FLANERY, Supt.

P. W. O'Sullivan, Wolf River, La	$1 00
John H. Meehan, New Iberia	1 00
Same. *For the baby!*	1 00
James Maloney, Fort McComb	1 00
Same. *For the baby!*	1 00
P. Delgado, Brickley	1 00
Geo. W. Solman, Vermillion	2 00
J. D. Kehan, Lake Charles	1 00
W. T. D. Meehan, Mermenton	2 00
A. Vincent, Sassafras	1 00
Jerry Ring, foreman	2 00
Pat. Ring, repairer	1 00
James Keely, repairer	1 00
Dan Mahony, repairer	1 00
John McElroy, repairer	1 00
	$18 00

Here comes a warm hearted man and a good looking family behind him:

NEW HAMPSHIRE.

CONCORD, N. H., Oct. 30, 1870.

J. D. REID, *Esq.*,

DEAR SIR: Inclosed please find $29 75 from the White Mountain line for the Morse Testimonial, with our warmest wishes for its complete success. Yours, H. N. ROWELL.

Ed. Savage, manager, Lancaster, N. H	$1 00
Miss M. Blodgett, operator, Lancaster, N. H	1 00
F. H. Gove, operator, Whitefield, N. H	1 00
J. A. Kennedy, operator, Littleton, N. H	50
C. J. Keisea, manager, Lisbon, N. H	1 00
A. B. Woodworth, ex-manager, Lisbon, N. H	50
J. R. Young, ex-manager, Lisbon, N. H	50
W. P. Whitcher, ex-manager, Lisbon, N. H	50
S. F. Hoskins, ex-manager, Lisbon, N. H	50
E. H. Woodworth, ex-manager, Lisbon, N. H	25
H. P. Ross, manager, Bath, N. H	1 00
H. W. Ramsey, manager, Woodsville, N. H	1 00
Miss H. F. Morrison, manager, Haverhill, N. H	1 00
J. G. Jewell, manager, Warren, N. H	50
J. B. Eastman, operator, Wentworth, N. H	1 00
A. B. Ross, manager, Rumney, N. H	1 00
A. W. Ross, operator, Rumney, N. H	50
W. R. Brackett, manager, Plymouth, N. H	1 00
J. D. Woodman, manager, Ashland, N. H	1 00
J. T. Sturtevant, operator, Meredith Village, N. H	1 00
W. S. Taylor, manager, Lake Village, N. H	1 00
Geo. F. Leavett, operator, Laconia, N. H	1 00
C. W. Morrison, operator, Tilton, N. H	1 50
L. Clough, operator, East Concord, N. H	1 00
Chas. A. Miller, operator, Centre Harbor, N. H	1 00
Miss M. J. Gilman, manager, Tamworth, N. H	1 00
C. J. Poole, operator, Conway, N. H	1 00
R. V. Stuart, manager, North Conway, N. H	1 00
James Priest, manager, Derry, N. H	2 00
John H. Priest, operator, Derry, N. H	1 00
J. O. Parker, manager, Methuen, Mass	50
J. N. Lando, repairer, Concord, N. H	1 00
H. N. Rowell, repairer, Concord, N. H	1 00
	$29 75

Connecticut has been waiting her turn, and we now expect confidently a hearty response from every part of the State:

NORWICH, Conn., Oct. 26, 1870.

DEAR SIR: Enclosed please find $15 50, amount subscribed by the undersigned for the Morse Testimonial Fund.

Yours, CHARLES E. CASE, Manager.

Charles E. Case, manager, Norwich, Conn	$1 00
G. M. Reynolds, operator, Norwich, Conn	1 00
Edward C. Cook, operator, Norwich, Conn	1 00
Edward Clapp, operator, Norwich, Conn	1 00
C. E. Hilton, operator, Norwich, Conn	1 00
M. C. Dennison, clerk, Norwich, Conn	1 00
Fred. N. Cook, messenger, Norwich, Conn	50
Thomas Farrell, messenger, Norwich, Conn	50
C. M. Nash, operator, Franklin Telegraph Co	1 00
Lizzie W. Follansbee, operator, Webster, Mass	1 00
L. Addie Boardman, Putnam, Conn	50
Emma J. Shumway, Danielsville, Conn	1 00
Mamie E. Bailey, operator, Summit, R. I.	1 00
Emilie Lester, operator, Willimantic, Conn	1 00
Carrie E. Dorman, operator, Stafford Springs, Conn	1 00
F. M. Davison, N. L. and N. R. R. Tel., Norwich, Conn	1 00
Lon E. Post, Putnam, Conn	1 00
	$15 50

NEW HAVEN, CONNECTICUT.

We are glad to receive the following:

J. M. Fairchild	$1 00	F. S. Burnett	$1 00
D. B. Case	1 00	W. T. Hotchkiss	1 00
W. H. Fairchild	1 00	Francis Ingoldsby	1 00
B. D. Hubbard	1 00	Harvey Bronson	1 00
Fred. Fairchild	1 00	J. McColliff	1 00
George W. Chapin, operator, E. Hampton, Mass.			1 00
J. Bond, operator, Plantsville, Conn			1 00
			$12 00

MONONA, Iowa, Nov. 3, 1870.

J. D. REID—

DEAR SIR. Mr. J. S. Ryan, of North McGregor, hands me $15 to forward to you for the Morse statue, contributed by the following parties:

J. S. Ryan, North McGregor, Iowa	$2 00
George B. Smith, Monona, Iowa	1 00
A. M. Bronson, Luana, Iowa	1 00
E. W. Ruff, Postville, Iowa	1 00
Thos. Nash, Postville, Iowa	1 00
J. F. Crapsey, Castalia, Iowa	1 00
Clark Sutherland, Ossian, Iowa	1 00
H. Conroy, New Hampton, Iowa	1 00
Geo. H. Crowns, McGregor, Iowa	1 00
W. C. Carpenter, Adams, Minn	1 00
Wm. T. Loper, Austin, Minn	1 00
M. J. Carpenter, Austin, Minn	1 00
Geo. A. Evans, Owatonna, Minn	1 00
J. B. Anderson, Monona, Iowa	1 00
	$15 00

Others have signified their intention of adding to the fund, but have not yet done so, and I forward the amount already paid in lest we be left out in the cold. Yours, &c.,

J. B. ANDERSON.

PAN HANDLE ROUTE.

PITTSBURG, CINCINNATI AND ST. LOUIS RAILWAY.

DEAR SIR:—The accompanying list constitutes the majority of the operators on this road. More may be expected soon. Each one says "God speed the work." We remember the good ship "Sully" that sailed in 1832. Yours,

D. ANDRUS, Manager,

LOGANSPORT, Indiana.

D. E. Andrus, Manager, Logansport, Ind	$3 00	Israel Nordyke, Manager, Wolcott, Ind	$1 00
J. O. Moore, Operator Logansport, Ind	1 00	Robert Parker, Manager, Remington, Ind	1 00
William H. Hartman, Operator, Logansport, Ind	1 00	Frank A. Dunn, Manager, Goodland, Ind	1 00
C. R. Green, Operator, Logansport, Ind	1 00	B. M. Chaffer, Manager, Kentland, Ind	1 00
H. Perrin, Operator, Logansport, Ind	1 00	J. E. Fairhead, Operator, State Line, Ind. and Ill.	1 00
A. R. Hurd, Operator, Logansport, Ind	1 00	J. B. Shaw, Manager, state Line, Ind. and Ill	1 00
D. T. Bacon, Operator, Logansport, Ind	1 00	Frank Little, Manager, Reynolds, Ind	1 00
Chas. A. Post, Operator, Logansport, Ind	1 00	G. W. Dolph, Manager, Winnemac, Ind	1 00
Geo. A. Hurl, Operator, Logansport, Ind	1 00	H. Lightcap, Manager, North Judson, Ind	1 00
D. C. Develin, Operator, Burnettsville, Ind	1 50	S. R. Vinson Manager, La Crosse, Ind	1 00
Jos. V. Vinson, Manager, Monticello, Ind	1 00	J. E. Morris Operator, La Crosse, Ind	50
E. M. Howard, Operator, Bunker Hill, Ind	1 00	W. H. H. Reeder, Operator, Ridgeville, Ind	1 00
Mrs. E. M. Howard, Operator, Bunker Hill, Ind.	1 00	R. A. Lybrook, Operator, Pikeville, O	1 00
Dan. Dills, Operator, Marion, Ind	1 00	J. M. Root, Operator, Bradford Junction, O	1 00
			$30 00

A WHOLE CONNECTICUT FAMILY.

BRIDGEPORT, Conn., Nov. 12, 1870.

DEAR SIR:—The following subscriptions to the Morse Testimonial includes the entire telegraph force of this city, together with every office on the line of the Naugatuck R. R., and nearly all on the Housatonic R. R. Many of the names omitted have previously sent their subscription. Very respectfully,

W. N. SPERRY.

BRIDGEPORT, CONN.

W. N. Sperry	$1 00
Geo. Otis (2d rem.)	50
M. M. Downer	1 00
K. A. Murphy	1 00
S. L. Nash	1 00
E. T. Bartlett	1 00
John Hanrahan	1 00
W. H. Foote, H. R. R.	1 00
C. S. Thompson, Naug. R. R.	1 00
L. B. Nickerson, Naug. R. R.	50
C. K. Hunt, retired operator	1 00
T. L. Watson retired operator	1 00
Messengers—Frank Burnham	50
John Fitzgerald	25
John Ferris	25
William Smith	25
Geo. Martin	25
	$12 50
M. A. Locke, Birmingham, Conn.	1 00
Fred Rolfe, messenger, Birmingham, Conn	25
John Corcoran, messenger, Birmingham, Conn	25
John Ennis, Ansonia, Conn.	1 00
S. H. Canfield, Seymour, Conn	1 00
G. A. Waterbury, Naugatuck, Conn	1 00
S. M. Woodford, Thomaston, Conn	1 00
H. W. Wessels, Litchfield, Conn	1 00
Geo. Munger, Litchfield, Conn	1 00
Charles McNeil, Wolcottville, Conn	1 00
H. H. Churchill, Winsted, Conn	1 00
C. H. Platt, Stepney, Conn	1 00
J. Botsford, New Haven, Conn	1 00
L. N. Jennings, New Milford, Conn	1 00
Nellie C. Merwin, Merwinsville, Conn	1 00
R. C. Crandall, West Cornwall, Conn	50
V. F. McNeill, Cornwall Bridge, Conn	1 00
C. S. Smith, Kent, Conn	1 00
F. W. Henry, Canaan, Conn	1 00
S. C. Freeman, Great Barrington, Mass	1 00
Miss Waters, Stockbridge, Mass	1 00
	$31 50

PENNSYLVANIA.

DELAWARE AND HUDSON CANAL CO. TELEGRAPH.

Charles Petersen, Sup't, Honesdale, Pa	$5 00
G. P. Knapp, Westbrookville, Pa	1 00
N. L. Reichard, Providence, Pa.	1 00
H. B. Snyder, Rondout, N. Y.	1 00
F. D. West, Mongaup, N. Y.	1 00
J. J. Heiss, Mongaup, N. Y.	1 00
Belle Ennes, Rowland, Pa.	1 00
Eugene Hill, Eddyville, N. Y.	1 00
J. J. Terwilliger, High Falls, N. Y.	1 00
W. G. Hill, Ellenville, N. Y.	1 00
C. P. Jones, Olyphant, Pa	1 00
C. A. Weiss, Scranton, Pa	1 00
James H. Smith, Carbondale, Pa	1 00
A. V. Gerbig, Archbald, Pa.	1 00
C. McMullen, Waymart, Pa	1 00
W. Schoonmaker, Kishonkson, N. Y.	1 00
E. J. Lord, Hawley, Pa	1 00
Gussie Snyder, Rosendale, N. Y.	1 00
	$22 00

CIN. HAMILTON & DAYTON AND D. & M. R. R. CO.

L Brooke	$1 00	J B Stally	$2 00
D E Scheehan	1 00	E C W King	1 00
A Sampson	1 00	W R Stage	1 00
W E Boyd	1 00	Jas Barkalow	1 00
A M Bodge	1 00	T T Werner	1 00
S C Robinson	1 00	Johnson Bienvelt	1 00
S T Scheeffer	1 00	A M Neifer	1 00
J L Orbison	1 00	J Patchen, Jr	1 00
C R Lane	1 00	Geo M Lane	1 00
Z T Miller	1 00	H G Boner, messenger	25
S S Dix	1 00		
			$21 25

A number of our operators have already sent their subscriptions. We all wish our subscriptions could be larger.

Yours, GEORGE M. LANE, Sup't.

Mr. Whitney, of Indianapolis, sends us the following lists:

INDIANAPOLIS, CINCINNATI AND LAFAYETTE R. R.

W W Payne, Cincinnati, O	$5 00
J Sherwood, "	1 00
P Callahan, "	1 00
N E Wasson, "	1 00
S S Judd, "	1 00
J C Davis, "	1 00
Charles Bast, Delhi, O	1 00
A Slater, Cleve, O	1 00
W G Riggin, Valley Junction, O	1 00
Geo Bender, " "	1 00
Richard Welch, messenger, Cincinnati, O	25
James E Pollock, operator Union Depot, Indianapolis	1 00
	$15 25

JEFFERSONVILLE, MADISON AND INDIANAPOLIS R. R.

A L Eggleston, sup't	$5 00	G C Adams, operator	$1 00
Z T Underwood, operator	1 00	D Wilson, "	1 00
C Arnold, "	1 00	W L Justus, "	1 00
W H Pennington, "	1 00	D G Justus, "	1 00
J L Perry, "	1 00	W S Cone, "	1 00
T T Erringer, "	1 00	J R Sears, "	1 00
T J Bain, "	1 00	R B Ryan, "	1 00
H H Pinney, "	1 00	Jas Lewis, "	1 00
Wm Logan, "	1 00		
			$21 00

Here is another member of the family arrived. Come along, all of you.

DETROIT, MICHIGAN.

E C Leavenworth	$1 00	Thomas J Cooper	$1 00
W H Stanton	1 00	J C Sullivan	1 00
W A Jackson	1 00	F A Forbes	1 00
C Fox	1 00	S B Dwight	1 00
Fred G Mann	1 00	J E T Yates	1 00
C Corbett	3 00	J S Murphy	1 00
G P Kingsbury	1 00	P J Hedges	1 00
			$16 00

NEW MEXICO.

SANTA FE, N. M., Nov. 14, 1870.

JAMES D. REID, *Editor*.

MY DEAR SIR: I have the pleasure of sending you herewith inclosed the sum of twelve dollars, subscribed to the Morse Testimonial Fund. We do not live so near the eternal snows of the Rocky Mountains but that our hearts beat warmly in sympathy with this movement.

J M Gough, manager Santa Fe, N. M. office	$1 00
W H Nash, chief commissary Dist., N. M., old operator	1 00
Daily *New Mexican*, newspaper, Santa Fe, N. M.	1 00
Daily Post, newspaper, Santa Fe, N. M.	1 00
J S Barbey, manager, Las Vegas, N. M.	1 00
H B Smith, manager, Fort Union, N. M.	1 00
—— Stebbins, chief q. m. clerk, Fort Union Depot, N. M. old operator	
Lieutenant A. B. Jerome, Fort Union, N. M.	1 00
B W Rice, manager, Cimarron, N. M.	1 00
A W Bush, formerly at Cimarron, N. M., now at Trinidad, Col., second subscription	1 00
C D Snyder, manager Pueblo, Col.	1 00
Capt. A. B. Wells, 8th U. S. Cavalry	1 00
	$12 00

Respectfully yours,

JOSEPH M. GOUGH.

MISCELLANEOUS

C. E. Arnold, operator, Glenn's Falls, N. Y.	$1 00	George C. White, Peru, N. Y.	50
J. W. Copeland, Brandon, Vt.	1 00	Operator, by B. Clark	1 00
Frank E. Zeigler, Columbia, Pa.	1 00	W. C. Burke, New York	1 00
F. Sanborn, Peru, N. Y.	1 00	H. H. Pitts, Agent Olympia, Wash. Ter.	1 00

J J Moore, manager, Machias, Me	2 00
W F Davis, mechanician, Jersey City	1 00
J C Lane, New York	1 00
T E Shull, R R contractor, Embreville, Pa.	1 00
John Grumbly, idem, Connellsville, Pa	50
W W Pitcairn, ticket ag't & operator, Allegheny City, Pa.	1 00
John B Gibson, Maysville, Ky	1 00
Edward Manley, operator, Perth Amboy, N J	1 00
E T Cummings, manager, Staatsburg, N Y	$1 00
M Cummings, messenger, " "	25
C Nice, B C Junction, Pa.	1 00
W H Winfield, manager, Camden, Mo	1 00
Fred Crouse, manager, Riegelsville, N. J	1 00
J B Brinton, operator, Mingo, O	1 00
Josie C Adams, Chicago, Ill	1 00
J B Sheldon, Cairo, Ill	1 00
W. H. Northway, Burnett, Wis	$1 00

The following list has never reached us, although mailed by Mr. Wait, June 14, 1870. The copy of the letter sent us is without date, and the residences of the subscribers are not given.

F. W. Cole	50	T. Price	1 00
E. Birchard	$2 00	M. J. French	1 00
D. Higley	1 00	Kate Dinehart	1 00
H. B. Dutcher	1 00	E. O. Wait	1 00
M. J. White	1 00		
J. F. Gale	1 00		$10 50

ST. PAUL AND SIOUX CITY RAILROAD.

ST. PAUL, Minn., Nov. 5, 1870.

DEAR SIR:—Please place our names on the list of subscribers to the Morse Testimonial Fund with the amounts opposite.

Very Respectfully,

T. E. Clarke, train despatcher	$2 00
T. W. Henderson, operator, Hamilton, Minn	2 00
Alef. Barnard, operator, Shakopee, Minn	1 00
A. B. Boylan, operator, Belle Plain, Minn	2 00
Geo. Cassady, operator, Blakely, Minn	1 00
Lee Hensley, opeartor, Le Sueur, Minn	1 00
L. Ming, operator, St. Peter, Minn	2 00
W. H. Drake, operator, Mankato, Minn	1 00
Thomas Langdon, operator, Lake Crystal, Minn	2 00
E. L. Ryder, operator, St. James, Minn	1 00
J. H. Badgeley, operator, Ottawa, Minn	1 00
	$16 00

H. McDougal, St. Paul, Minn	$1 00
J. A. Towns, Salena, Kansas	1 00

Just as we are going to press, Sup't Gifford has handed us the following:

George A Redman, Rochester, N Y	$1 00
C A Wykhouse, Rochester, N Y	1 00
W H Parsons, Utica, N Y	1 00
John J Flanagan, Utica, N Y	1 00
Chas L Rogers, Utica, N Y	1 00
Nelson H Mouck, Utica, N Y	1 00
C. H. Robinson, Rochester, N. Y	1 00
Millard C Sink, Rochester, N. Y	50
Theo H Allen, Rochester, N. Y	50
Will Sisk, Rochester, N. Y	50
John S Hughes, Rochester, N. Y	50
Chas V Parker, Rochester, N. Y	50
Miss Emily C Ormsby, Homer, N Y	1 00
Total	$10 50

◆

In a letter recently received in this city from an official of the Montreal Telegraph Co., we make the following extract:

"We are greatly extending our lines here, and our stock is now in demand at 2-20. This is remarkable, with a tariff of little more than an average of 25c. for ten words, no matter how great the distance."

◆

Our friend, C. H. H. Pannell, a few years ago well known as one of the Receivers of the Western Union Telegraph Company, is now pastor of the Eastern Congregational church of Brooklyn. Possessed of fine poetic talent, and blessed with a heart full of sympathy with his fellows, we predict for him a useful life, and trust it may be long.

◆

THANKSGIVING AMONG THE TELEGRAPHERS.—In return for the visit of May 10th last, from the telegraphers of Binghamton, etc., the operators of the various offices in this city went to Binghamton on Thursday. They left on the 8:30 A. M. train via Southern Central and were joined at Richford by E. H. Rich, Sup't Dryden & Groton line. Arriving at Owego 12:30 they were met by manager Parmelee and entertained until 1:15, when the Elmira train brought Sup't Berry, Manager Palmer and Brick of that place. The party joined them and arrived at Binghamton 2:00 P. M., where they were met by operators of that place, Messrs. Schnell, Elser, Arnott, Snyder, Babb, Root and Hagaman. A sumptuous dinner was had at the Exchange Hotel, after which the guests were transported in coaches to the Inebriate Asylum, being shown through the institution by its eminent and obliging Superintendent, Dr. Dodge. None of the party were left behind on returning.

The excursionists from here comprised Messrs. Titus, Sperry, Graham, Foote, Tobin, Gavigan, and Cheesebro. —*Auburn Journal.*

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

ANNUAL MEETING.

TREASURER'S REPORT.

GENTLEMEN: At your last annual meeting the nominal membership of your Association was 647. Of these 10 had died, and about 30 were regarded as doubtful. The actual reliable membership was about 600.

Since then 349 certificates have been issued, the last being number 996, Oct. 27th. Six deaths have occurred during the year, which, with the ten former deaths, and 137 delinquents regarded as having voluntarily dropped their membership, leaves a membership, Nov. 1, 1870, of 843. The membership is very scattered, and represents 35 States or Territories, besides Panama and Canada, as shown by the following table:

Maine	2	Alabama	26
Vermont	6	Mississippi	13
New Hampshire	1	Missouri	13
Massachusetts	12	Tennessee	23
Connecticut	12	Kentucky	19
New York	265	Louisiana	6
New Jersey	19	Texas	5
Pennsylvania	67	Ohio	60
Maryland	7	Indiana	61
District of Columbia	13	Illinois	65
Canada	9	Arkansas	1
Nevada	3	Wisconsin	5
California	6	Minnesota	3
Wyoming Ter	2	Iowa	14
Virginia	16	Kansas	10
North Carolina	3	Michigan	11
South Carolina	5	West Virginia	4
Georgia	30	Aspinwall	1
Florida	2		
			843

There seems no doubt that the actual reliable membership will soon be 1,000.

The expenses of the year have been as follows:

Certificate Books		$8 00
Books of entry		7 00
Postages		2 50
Printing		4 00
		$21 50
Balance on hand Nov 1, 1869	$126 04	
Fifty cent fees Nov. 1, '69, to Nov. 1, '70,	174 50	300 54
Balance on hand		$279 04

The total settlements of the year will amount to about $4,000. So far as can be ascertained the deaths have not been the result of any vitiating influences connected with the occupation of the parties, in distinction from those attending any other equally confining pursuit. With the exception of about 150, the remittances have been promptly sent, and the payments to heirs gratefully received. Full settlement has not yet been made with the two last, the former because of perplexity as to the recognition of heirs, and the latter because the assessments have not yet been paid up sufficiently to justify it.

So systematically has the Secretary arranged his plans for settling with me and for keeping our mutual accounts, that the whole labor of the year, which has been considerable, has been performed without difficulty, and with great pleasure. His labor has been very great, and he richly deserves your thanks for the fidelity and cheerfulness with which he has performed his duties.

ASSESSMENT NO. 15.

C V Lamb,
Andrew Ainsworth,
M H Bacon,
P Degan,
R H Bishop,
W J Allen,
Waller Davis,
A Davis,
C P McAllister,
W J Craig,
A A Smith, Jr.,
J Wensell,
E J Saville, 14 and 15,
H D Scott,
C C Marian,
R B Woolsey,
W H Stiegelmaier,
T T Onderdonk,
W Stoneback,
G H Wadsworth, 14 and 15,
S Lawrence,
A A Sprague, 13, 14 and 15,
R N Norton,
R G Fox,
W W Smith,
J Fuller,
T Cream, 14 and 15,
M Foley,
J W Lewis,
H C Wilson,
A Pope,
W H Hamlin,
J M Armstrong,
M D O'Connor,
Sam Ward,
G W Dyer,
P J Casey,
M Bullard, 14 and 15,
H V Russell,
A F Crissey, 14 and 15,
F J Nicholson
C S Le Baron,
J L Martin,
F E Marsh,
M F Freeman,
V B De La,
W T King.

ASSESSMENT NO. 16.

J F Collins, 15 and 16,
C S Jones, 15 and 16,
J H Rugg, 15 and 16,
J F Hare, 15 and 16,
H L Waterbury, 15 and 16,
G M Harrison, 15 and 16,
E S Keep, 15 and 16,
G C Thompson, 15 and 16,
W D Peck, 15 and 16,
G P Riley, 15 and 16,
E R Willerton, 15 and 16,
C W Hills, 15 and 16,
J M Powers, 15 and 16,
Thomas Johnson, 14, 15, 16,
H D Reynolds,
F K Hon,
J H Barker,
D B Hamlin,
F Loesch,
Sam'l Porter,
A Kern,
J S Zimmerman,
E C Boyle,
C R Fitch,
O Dodge,
S B Gifford,
D L Pike,
D V Ferris,
J C Kelly,
E N Taylor,
A J Schall,
H E Doolittle,
F A Randall,
G G Hadley,
G W Snow,
R W Waterman,
A J Carnahan,
W J Logan,
R W Allen,
W V Stephens,
M E Cozzens, 15 and 16,
C C Scott,
C A Stuart,
A G Chapin,
B P Humphreys,
E Hungerford,
D S Bailey,
P W Bowers,
A Ainsworth,
A S Downer, 15 and 16,
W J McDonald,
F S Belden,
J S Henry,
J S Scobbell,
G W Baxter,
J P Golden,
D T Francis,
A K Burroughs, 15 16,
A S Adams, 15 16,
R W Marriott,
C E Berle,
G D Butler, 15 16,
Wm. Spinner,
D J Dingman,
G T Goulding,
S M Dunlop,
G N Norton,
W V Duke,
C Schmidt,
H J Nichols,
W L Biggert,
G A Dodd,
G E Spellman, 15 16,
T A Mayes,
L E Curtis,
S H Whitaker,
James Ogler, 15 16,
W F Browning,
J P Hines,
Z M Hunter,
J M Warden,
F O Van Dusen, 15 and 16,
L P Crum,
G F Gardiner,
W T Lindley, 15 and 16,
J B Van Every, 15 and 16,
C F Gegelken,
C V Lamb,
E J Stack,
Miss E Ward,
R O'Brien,
A E Myers,
T T Onderdonk,
J D McNeil,
J P Cassidy,
W W Ketchner,
W W Shock,
A Weller,
D H Henshaw,
G Robertson,
G H Strickler,
J M Dunsmore, 13, 14, 15 and 16,
J Coyne,
J Horn, Jr,
J A Casterlin,
M Phillips,
C Smith,
Dr. J A Cure,
T Bidwell,
C H Vogel, 15 and 16,
A H Copeland,
A C Cheeny,
J W Lee,
J T Stephenson,
H H Scobbell,
D D Forbes,
T J Hewlett, 15 and 16,
E A Brown, 14, 15 and 16,
C W Terrell,
E N Armstrong,
J C Henry,
M F Seymour, 14, 15 and 16,
E Reynolds,
Chapin Call, 15 and 16,
R C Humphreys,
J M Nye, 15 and 16,
J J Fowler,
C H Sedgwick,
J Doran,
M Erwin,
J A Conley,
M M Towne,
C D Sprague, 15 and 16,
J P Towler,
J M Marquette,
J H Parnell,
G W Dyer,
E Evarts,
A E Lang,
G W Baldwin, 14, 15 and 16,
C H Edwards, 14, 15 and 16,
C Berry, 13, 14, 15, and 16,
F W Delano,
W C Buell, 15 and 16,
B F Follett, 15 and 16
C S Follett, 15 and 16,
W H Ashby, 15 and 16,
F D Adams,
Jno Kane, 15 and 16,
J U Ansley, 15 and 16,
J S Fraim, 14, 15 and 16,
E Stone,
W Monaghan,
P Bruner,
J H Logan,
W S Thompson,
B S Plumley,
E Tullis,
J B Parkins,
G W Roberts,
W H Canniff,
L P Mattatal,
L Fryer,
W P Lucas,
W W Cummings,
P P Hauff,
E T Ward,
E Reynolds,

B G Fox,
W M White,
J M Armstrong,
C E Tweed, 15 16,
J V Brisben, 15 16,
C Brown, 15 16,
J A Fuller, 15 16,
J A Hasty, 15 16,
W H Hamlin,
J N Hoover, 15 16,
A T Langhorne, 15 16,
C Mingue, 15 16,
R A Taylor, 15 16,
J K Thomas, 15 16,
W H Vandegrift, 15 16,
A Winder, 15 16,
J C Wilson, 15 16,
C C Whitney, 15 16,
W Patterson, 15 16,
G H Williams, 15 16,
W H Boyd, 13, 15, 16,
L K Freeman, 15 16,
W S Mead, 15 16,
C M Pritchard, 15 16,
J M Bechtel,

A Bauer,
John Kennan,
J H Hoffman,
T R Fox,
R Wilkins,
P Fitchett,
L E Atwater,
S K Rupley,
J B Leach,
W W Burhans, 15 and 16,
P H Shaughness,
A Ferguson,
O S Wood,
E C Armstrong,
F A Armstrong,
O K Newton,
C L Snyder,
D W Warren,
J D Thurston,
G A Clark,
J C Hall,
W J Lawler,
S C Taylor,
J W Sherwood, 15 and 16,
C S Lamb,
O T Williams,
G W Trabue,
J Lonergan,
A H Stewart,
Robt Cowell,
N J Gibson,
J B Morris,
R J Wilson,
H B Spencer,
H Pride,
Mrs. A A Durant,
A W Haygood,
O A Horne,
T P Nightingale, 15 and 16,
C S Shivler,
W J Denver,
H Denver,
C H Smith,
J P Keene,
J J Harrigan,
I A Manley,
H R Myers,
C Dwyer,
R H Morris,
W D Mann,
Thos Hatch,
E C Parsons,
T B Needles,
C H Welch,
L A Louis,
W H Turner,
T Carrigan,
T S Proctor,
J U Ansley, 14, 15, and 16,
T. J Moore,
J C Campbell,
Martin Barth,
A S Conklin, 15 and 16,
James E Polk,
H D Scott,
A C McCurdy,
A J Reinhold,
C P McAllister,
W J Craig,
E R Kelsey,
J C Kuchler,
D C Roberts,
F H Seibert,
L W Louis,
J B Louis,
E B Clarke,
C E Moody,
G P Belden,
A J Hall,
E C Boyle,
F M Roberts,
M S Roberts,
J Lytle,
Sam Reese,
G A Jessup,
T H O'Reilly, 15 and 16,
J J Calahan, 15 and 16,
C E Higdon,
J Hansen, 15 and 16,
A M Young,
C T Huntington,
M D H Redding, 15 and 16,
C C Littlejohn,
C E Husted,
G J Whitehead,
W H Champlin,
H P Dwight,
B B Toye,
J Houlehan,
A Hunter,
R Preston,
D J Crowley,
J A Mantor,
W J Huggins,
C S Cutler,
N Stucker,
J W Tillinghast,
T Henning,
J W Lariah,
O C Barker,
G A Lance,
J Anderson, Jr,
A Stuart Brown,
D A Marcy,
J Cooper,
E V Weden,
W H Slocer,
J B Slocum,
T A Laird,
C M Frost,
E V Abrahams,
Chas Thom,
W G Servos,
H F Perach,
J Lapey,
J J Corcoran,
A W Pearkes,
D J Ludwig,
E F Ludwig,
G Lawrence,
T J Landy, 15 and 16,
B F Ely,
W C Everingum,
J H Pearce,
G F Durant,

MISCELLANEOUS.

M H Bacon, 15,
J A Mantor, 14,
W S Evans, 14,
J H McEachen, 14,
D Campbell, 14,
David Leary, 15 and 16,
C M Clark, 14,
Chapin Call, 14,
R W O'Brien, 14,
P A Smith, 14,
C E Clark, 14,
Andrew Clark, 14,
A R Fulda, 14 and 15,

MARRIED.

RIDER—DAVIS.—At the residence of the bride's parents, Durham, Ct., Tuesday evening, Nov. 15th, 1870, by the Rev. E. Cunningham, Mr. Elisha Rider, Manager W. U. Tel. Office, Meriden, Ct., to Miss Pauline L., only daughter of Watson and Olive C. Davis.

MERIWETHER—MOBLEY.—On the 10th inst., at the residence of the bride's father, in Escambia County, Ala., by the Rev. Wm. Carter, Mr. Chas. G. Meriwether, of Mobile, Superintendent of the W. U. T. Co., to Miss Mary Stuart Mobley, second daughter of Col. E. H. J. Mobley, recently of Wilcox County. No cards.

Camden, Wilcox County and Petersburg Va., papers please copy.

WARD—STOUGH.—At the residence of the bride's father, at Waterloo, Ind., Sept. 26th, by the Rev. J. B. Fowler, Mr. T. A. Ward, of the L. S. and M. S. Tel., to Miss Morgia A. Stough, of Waterloo, Ind.

DEVELIN—SHARP.—November 5, 1870, by the Rev. Franklin J. Tolby, Mr. L. C. Develin, Manager W. U. Tel. Office and Agent P. C. & St. L. R. R., Burnetsville, Ind., to Miss Mary D. Sharp, Kentland, Ind.

WALKER—FRANKS.—At Frazeysburg, O., Sunday, September 25, by Rev. H. Gorton, Mr. L. P. Walker to Miss Mollie A. Franks, of Frazeysburg, Ohio.

HILL—DE LA HOOKE.—On July 13, 1870, at the residence of the bride's sister, by Rev. J. F. Taylor, F. W. Hill, Bookkeeper W. U. Tel. Co., Detroit, to Hattie C. De La Hooke, all of Detroit, Mich.

WHEELER—ADAMS.—In Rockport, Me., Nov. 15, by Rev. Edward F. Strickland, Mr. Henry W. Wheeler, Ticket Agent P. & K. R R., and Manager W. U. Tel. Office, Brunswick, to Miss Mary I. Adams, of Castine.

STRONG—NORTON.—At Southampton, Mass., Nov. 23, by Rev. Mr. Wells, G. E. Strong, Agent —— R. R. and Manager W. U. Tel. Office, Royalston, Mass., and Cora A. Norton, of Southampton.

DIED.

HILL.—On Monday, November 21, Emily Chivvis, wife of Wm. H. Hill, and eldest daughter of the late Wm. Chivvis, aged 33 years.

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KEEP IN STOCK THE FOLLOWING ARTICLES:

- GALVANIZED WIRE,
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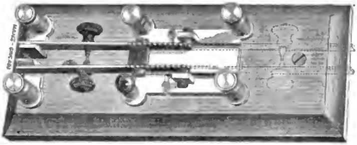
- WINDOW TUBES, BATTERY BRUSHES,
- SYRINGES, FUNNELS, HYDROMETERS,
- ACIDS AND CHEMICALS FOR BATTERIES,
- KERITE WIRE,
- BRAIDED AND WOUND OFFICE WIRE,
- GUTTA PERCHA OFFICE WIRE,
- SWITCH CORD,
- CALLAUD BATTERY,
- DANIELL BATTERY,
- GROVE BATTERY,
- BUNSEN BATTERY,
- LECLANCHE BATTERY,
- HILL BATTERY,



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- RELAYS,
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☞ Our Morse Instruments are of the Western Union, Ottawa (or Caton) style.

We have ample facilities for the execution of every variety of electrical work.

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PAT. APPLIED FOR.

We would call your attention to our

Telegraph Operators Badge Pin.

It is a perfect fac-simile of the present MORSE KEY. It is made of 18 carat gold, one inch long, and makes a beautiful bosom pin, or can be worn on the vest. It is the only pin that has ever been made exclusively for Operators.

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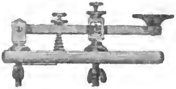
THE SELF-CLOSING

Telegraph Key.

PATENTED SEPT. 21, 1869.



A PERFECT SELF-CLOSER.

The circuit will always be kept closed when the operator ceases to use the key, and without manipulating any of the parts whatever, the key automatically closing when released from the pressure of the hand, additional parts for closing circuit being entirely dispensed with.

A spring keeps the lever elevated and in contact with the platina point inserted in the screw, the circuit being closed when the platina point in the screw is in contact with the platina point on the lever, and broken when the lever is pressed down. The lever is insulated on both sides, and on the under part by a casing of hard rubber. By changing the points of the Receiving Magnet, the Local Batteries are kept from action except when in actual use, and the sounder read in the usual manner, from the sound of the down stroke.

Other designs on the same principle. For rapid transmission of the Morse and similar characters, unexcelled.

The Keys are mounted on a black walnut base.

Sample Keys now ready.

Liberal terms and arrangements will be made with the Trade, Telegraph Companies and Contractors.

Further information furnished on application.

JOS. J. B. FREY,
Inventor and Patentee.

A. ILLING,
213 Church Street,
New York City.

A perfect, simple, homogeneous, self-closing key.—JOURNAL OF THE TELEGRAPH.

THE ONLY REALLY PRACTICAL AND COMPLETE MODE OF SECURING THE CLOSING OF KEYS IS THE PLAN OF MR. JOS. J. B. FREY. IT IS PERFECT OF ITS KIND, SURE AND ECONOMIC.—JOURNAL OF THE TELEGRAPH, New York City.

NEW YORK, Dec. 7, 1869.

JOS. J. B. FREY:

DEAR SIR:—Owing to my long confinement, I have not had an opportunity of seeing the practical working of your very beautiful and ingenious SELF-CLOSING TELEGRAPH KEY; but from an examination, the description, and reports of practical men who have tried it, I have formed a very favorable opinion of its efficiency, and I cordially wish you success in promoting its introduction on the Telegraph Lines.

Very truly yours,

(Signed,) SAM'L F. B. MORSE.

Western Union Telegraph Company.

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John Steward,
E. B. Wesley,
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Thomas Orton, *Supply Agent, Chicago, Ill.*

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" 4—C. O. Rowe,	Pittsburg, Pa.
" 5—E. P. Wright,	Cleveland, O.
" 6—John F. Wallick,	Indianapolis, Ind.
" 7—George T. Williams,	Cincinnati, O.

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Residence, New York City.

ASSISTANTS.

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" 4—George W. Gates,	White River Junction, Vt.
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Erie Railway District—W. J. Holmes,	New York

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Residence, Louisville, Ky.

ASSISTANTS.

Superintendents of Districts.

	Residence.
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" 2—J. W. Kates,	Lynchburg, Va.
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" 4—C. G. Meriwether,	Mobile, Ala.
" 5—James Compton,	Jackson, Miss.
" 6—James Coleman,	Memphis, Tenn.
" 7—Thomas Johnson,	Corinth, Miss.
" 8—Geo. W. Trabue,	Nashville, Tenn.
" 9—L. C. Baker,	Little Rock, Ark.
" 10—Wm. A. L'Hommedieu,	Monroe, La.
" 11—D. P. Shepherd,	Houston, Texas.
" 12—D. Flanery,	New Orleans, La.

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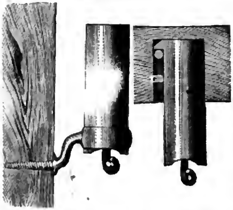

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REPAIRING THE FRENCH ATLANTIC CABLE.

The steamship "Robert Lowe," belonging to the Anglo-American and French-Atlantic Telegraph Companies, returned to the Thames a short time since, after repairing the American section of the French-Atlantic cable. This work was not done by Captain Blacklock without experiencing several difficulties. The exact position of the cable was not accurately marked on the chart, because the faulty portion had been laid in a thick fog. After dragging for it for some time, it was, however, hooked, and found to be in good electrical condition to St. Pierre; the fault was shown by the electrical tests to be twenty-five miles off, in the direction of Duxbury Beach. The St. Pierre end was buoyed, and then Captain Blacklock proceeded to wind in the cable with the picking-up machinery. After about twenty miles had been brought on board, a ship's anchor came up attached to the cable, and to free it from the anchor the cable had to be cut.

The picking up was then proceeded with, and at last the fault was reached. At the faulty part the cable had been willfully damaged and hacked, probably by some captain who hooked it with his anchor, and had damaged it in freeing his ship. At the time the fault was reached, the barometer fell, and it was plain that a storm was at hand. The end of the cable was therefore buoyed, and soon the storm was felt in all its force. One of the boats was swept away, and the men on the deck were frequently up to their waists in water. It was some days before the weather moderated sufficiently to permit the cable repairing operations to be resumed. The buoy could not be seen, but the cable was grappled once more, the splice made, the cable on board paid out, and the St. Pierre section reached. Then another splice was made, and the loop of the repaired cable dropped overboard.

On the way home a strange circumstance occurred, sufficiently resembling the "supernatural" to make a deep impression on everybody on board. One of the engineers, Mr. W. H. Pearce, of 87 Augusta street, East India road, Poplar, was taken seriously ill with typhus fever, and on the 4th of October last he died. A friend of his, a stoker named Brown, who, when on shore, lives at 1 Edward street, Hudson's road, Canning Town, Plaistow, attended Pearce for several days before his death. On the afternoon before Pearce died he was delirious, and tried to get out of bed, and while Brown was holding him down, Brown says that he saw on the other side of the bunk the wife, two children, and mother of the dying man, who are all still living. The mother, who looked very sorrowful, told him that her son would die, and then they all vanished instantaneously. In a fit of terror Brown rushed out of the cabin and told Captain Blacklock he would not enter it again, not even for a thousand pounds. Captain Blacklock urged him to go back, as his friend was dying; the weather was bad, and all the other men on board were fagged with hard work. It was all of no use; Brown was evidently thoroughly unnerved, so the Captain sent him out a glass of brandy. His mates had much trouble in soothing and calming him, and by degrees they drew from him the narrative of what he saw, or thought he saw. All on board have the fullest faith in the character and truthfulness of Brown, and on the return of the ship to the Victoria Docks a written statement of these facts was drawn up and signed by Captain Blacklock, Brown, and others on board, and handed to some gentlemen who are now actively engaged in scientifically investigating that which is called "supernatural."

But there is another strange part of this strange story. Mrs. Pearce was convinced before the ship reached England, and before the bad news had been received, that she would never again see her husband alive. A few days before his death, she was at the house of her mother-in-law, at Camden Town, and stopped the night. In the middle of the night she was awakened by three loud knocks, which she thought were given at the street door. On looking out there was nobody there. Then she says a deep dread came over her—she felt sure she should hear some bad news. When she went to bed again she had fearful dreams to the effect that she was a widow, and that all her children were dressed in black.—*Mechanics' Magazine.*

SAMUEL F. B. MORSE.

BY JAMES PARTON.

During the voyage of the packet ship Sully from Havre to New York, in October, 1832, a conversation arose one day in the cabin upon electricity and magnetism. Dr. Charles S. Jackson of Boston described an experiment recently made in Paris with an electro-magnet, by means of which electricity had been transmitted through a great length of wire, arranged in circles around the walls of a large apartment. The transmission had been instantaneous, and it seemed as though the flight of electricity was too rapid to be measured. Among the group of passengers no one listened more attentively to Dr. Jackson's recital than a New York artist named Samuel Finley Breeze Morse, who was returning from a three years' residence in Europe, whither he had gone for improvement in his art.

Painter as he was, he was nevertheless well versed in science, for which he had inherited an inclination. His father was that once famous geographer and doctor of divinity of Charlestown, Massachusetts, whose large work upon geography was to be found, half a century ago, in almost every considerable collection of books in America. Besides assisting his father in his geographical studies, Samuel Morse had studied chemistry at Yale College under Professor Silliman, and natural philosophy under Professor Day. After graduating from Yale in 1810, he went with Washington Allston to London, where he received instruction in painting from Mr. Benjamin West. Returning to the United States in 1815, he pursued his vocation with so much success that he was elected the first president of our National Academy, and held the office for sixteen years. In 1829 he went to Europe again for further improvement; and it was when returning from this visit that the conversation took place in the cabin of the Sully. During all the years of his artist life he had retained his early love for science, and usually kept himself well informed of its progress. Hence the eagerness with which he listened to Dr. Jackson's narrative.

"Why," said he," when the doctor had finished, "if that is so, and the presence of electricity could be made visible in any desired part of the circuit, I see no reason why intelligence might not be transmitted instantaneously by electricity."

"How convenient it would be," added one of the passengers, "if we could send news in that manner."

"Why can't we?" asked Morse, fascinated by the idea.

From that hour the subject occupied his thoughts, and he began forthwith to exercise his Yankee ingenuity in devising the requisite apparatus. Voyages were long in those days, and he had nothing to do but meditate and contrive. Before the Sully dropped her anchor in New York Harbor he had invented and put upon paper, in drawings and explanatory words, the chief features of the apparatus employed, to this hour, by far the greater number of the telegraphic lines throughout the world.

The system of dots and marks, the narrow ribbon of paper upon a revolving block, and a mode of burying the wires in the earth after inclosing them in tubes, all were thought of and recorded on board the packet ship. The invention, in fact, so far as the theory and the essential devices were concerned, except alone the idea of suspending the wires upon posts, was completed on board the vessel. A few days after landing, the plan, now universally adopted, of supporting the wires was thought of by the inventor, though he still preferred his original conception of the buried tubes.

The reader, of course, is aware that the mere idea of transmitting intelligence by electricity was not original with Samuel Morse. From the time when Dr. Franklin and his friends stretched a wire across the Schuylkill River, and killed a turkey for their dinner by a shock from an electrical machine on the other side of the stream, the notion had existed of using the marvelous fluid for transmitting intelligence; and long before the Sully was launched some attempts had been made in this direction which were not wholly unsuccessful. Science had done her part. It remained for the inventor to devise an apparatus which would utilize scientific truth, and Samuel Morse was the individual.

An artist arriving at home after a three year's residence in foreign countries is not apt to be furnished with a great abundance of cash capital; nor is he usually able to spend any more time in unproductive industry. Three years passed before Mr. Morse had set up his rude apparatus of half a mile of wire and a wooden clock, adapted to the purpose by his own hands, and sent a message from one end of his wire to the other, legible at least by himself. He used to exhibit his apparatus now and then to his friends, and he spent all the time he could spare from his profession in perfecting it. For some time it was placed in a large room of the New York University, where, in the Fall of 1837, large numbers of persons witnessed its operation.

The invention attracted much notice at the time, as I can just remember. Every one said, "How wonderful! how ingenious!" and boasted of the progress man was making in science; but scarcely any one believed that the invention could be turned to profitable account, and no man could be found in New York willing to risk his capital in putting the invention to a practical test. By this time, however, Mr. Morse had become fully possessed by the inventor's mania, which shuts a man's eyes to all obstacles, and forces him to pursue his project to the uttermost.

Having no other resource he went to Washington in 1838, arranged his apparatus there, exhibited its performance to as many members as he could induce to attend, and petitioned Congress for a grant of public money with which to make an experimental line between Washington and Baltimore, a distance of forty miles. It is weary work getting a grant of money from Congress for such a purpose; and it *ought* to be, for Congress has no constitutional right to give away the people's money to test such an invention. A committee reported upon it favorably, but nothing further was done during the session.

He crossed the ocean to seek assistance in Europe. His efforts were fruitless. Neither in France nor in England could he obtain public or private encouragement. It seemed out of the sphere of government, and capitalists were strangely obtuse, not to the merits of the invention, but to the probability of its being profitable. They could not conceive that any considerable number of persons in a country would care to pay for the instantaneous transmission of news. Returning home disappointed, but not discouraged, he renewed his efforts, winter after winter, using all the influence of his personal presence at Washington, and all his powers of argument and persuasion.

March the third, 1843, the last day of the session, was come. He attended all day the House of Representatives, faintly hoping that something might be done for him before the final adjournment; but as the evening wore away the pressure and confusion increased, and at length hope died within him, and he left the Capitol. He walked sadly home and went to bed.

Imagine the rapture with which he heard, on the following morning, that Congress, late in the night, amid the roar and stress preceding the adjournment, had voted him thirty thousand dollars for constructing his experimental line! Eleven years and a half had passed since he had made his invention on board the ship. Perhaps, on that morning, he thought it worth while to strive and suffer for so long a period to enjoy the thrill and ecstasy which he then experienced.

But his troubles were far from being over. Clinging still to his original notion of inclosing the wires in buried tubes, he wasted nearly a whole year, and spent $23,000 of his appropriation in discovering that the plan would not work. He resorted at length to the system of wires suspended upon poles; and on the 1st of May, 1844, messages were transmitted between the two cities, and the electric telegraph was an accomplished fact!

Many years elapsed before the invention was of much advantage to Mr. Morse. Rival inventors entered the field, and rival companies spoiled the business. It was not until the consolidation of most of the companies into two or three that the business of transmitting messages by telegraph was very profitable to any one. During the last few years the inventor has been enriched; but I presume there are at least fifty persons now living who, without having contributed an idea to the invention, have made more money by it than the inventor.

What an astounding development the business has attained in the United States! We have one company the capital stock of which is $41,000,000, and the receipts during the year 1869 $7,500,000, of which more than $2,500,000 were profit. This company has 121,395 miles of wire, 3,469 stations, 2,607 instruments for reading by sound, 1,334 recording instruments, and 22,000 magnetic battery cups. It transmitted last year 40,000,000 messages, and an amount of newspaper matter equal to about 30,000 columns of the New York *Ledger*. There is one telegraphic office in the City of New York in which 126 operators are employed, and you may see them at work if you step in at the corner of Broadway and Liberty street. It is not unusual for this office to receive and send 30,000 messages in one day. Not far from the *Ledger* office there is a small sign-board over one of the cable offices, which I should suppose Mr. Morse could never read without emotion. It is this:

"Telegraphic messages sent to all parts of Europe, Asia, and Africa."

◆

From the Mechanics' Magazine.

THE AURORA BOREALIS.

The aurora borealis depends in all probability on the passage of electricity through a highly rarefied medium. From the calculations of Mr. Cavendish it is probable that the aurora usually appears at an elevation of about 71 miles above the earth's surface. At this elevation the density of the atmosphere must be but the $\frac{1}{10}$ part of that at the earth's surface, a degree of rarefaction far above that ordinarily afforded by good air-pumps. As electricity is diffused in a quantity nearly proportionate to the elevation above the earth's surface, it appears very probable that, under favorable circumstances, an inductive transmission of electricity would appear luminous to us in the vast regions of rarefied air terminating our atmosphere, in a manner analogous to that in which it appears on an infinately smaller scale in an air pump vacuum. The constant direction of the arc of the aurora as regards the magnetic meridian, and their action on the magnetic needle, show that they ought to be attributed to these electric current in the higher regions. This hypothesis has had ample confirmation both recently and in previous years. In France and in other countries on August 20 and September 1, 1859, it was observed that two brilliant aurora boreales acted powerfully on the wires of the electric telegraph. The alarums were for a long time violently rung and dispatches were frequently interrupted by the spontaneous abnormal working of the apparatus. The recent magnificent displays on the evenings of the 24th and 25th of October last seriously interfered with the working of the telegraphs, putting some of the wires altogether *hors de combat*, and charging others with the electric currents which rendered the transmission of signals both difficult and uncertain. This state of things prevailed not merely during the evenings when the aurora was visible, but also during the daytime, when the cause of the strong earth currents prevalent on all the northern and on many of the north-western and Irish circuits could only be conjectured. Of course, this severe electrical disturbance caused a considerable amount of delay on the circuits which were chiefly affected.

That there is an intimate connection between the aurora borealis and the magnetism of the earth is shown by many facts. The occurrence of the aurora has invariably been found at Greenwich and elsewhere to be accompanied by considerable magnetic disturbance. This is especially the case when brilliant corruscations are observed to shoot up towards the zenith; at such times, large deflections of the declination and bifilar magnets occur simultaneously. Discharges of atmospheric electricity, however, do not appear to have any similar effect on the magnetic instruments. So closely is magnetic disturbance connected with the aurora that practiced observers can ascertain the existence of an aurora borealis by the indications of the needle, when the phenomenon itself is not visible to them. The vertex likewise of the luminous arch is almost always found to be in, or very near to, the magnetic meridian, and the boreal crown has its seat in the prolongation of the freely suspended needle. There seems, moreover, to be a connection between the magnetic poles of the earth in regard to the aurora, for, so far as has been ascertained, the meteor occurs simultaneously at both.

The electrical hypothesis is supported by M. de la Rive, whose opinion is that the aurora are due to electric discharges which take place in polar regions between the positive electricity of the atmosphere and the negative electricity of the terrestrial globe. These electricities themselves are separated by the action of the sun, principally on the equatorial regions. The electrical hypothesis is also borne out to a great extent, as we have already seen, by the effect of the aurora on the telegraph wires. A further confirmation is afforded by its effects upon highly sensitive and nervous organizations. We have become aware of several cases lately, in which an effect has been produced on the human system precisely analogous to that experienced from thunder storms, or a highly electrical state of the atmosphere. If any further evidence were wanted to confirm this theory, we would refer to the mimic aurora which can be produced by the electrical apparatus. Dr. Lardner gives the following directions for producing this phenomenon in a very striking manner:—A glass tube about 3 in. in diameter and 30 in. in length is to be capped at each end, and to have a pointed wire fixed to the interior of each of the caps. One cap is to be screwed upon the plate of the air pump, while the external knob of the other is connected by a metallic chain with the prime conductor of the electrical machine. When the machine is worked in the dark—the tube being exhausted—a succession of luminous phenomenon will be produced in the tube, which bear so close a resemblance to the aurora borealis as to leave no doubt as to the origin of that meteor. When the exhaustion of the tube is nearly perfect the whole length of the tube will exhibit a violet red light. If a small quantity of air be admitted, luminous flashes will be seen to issue from the two points attached to the caps. As more and more air is admitted, the flashes of light, which glide in a serpentine form down the interior of the tube, will become more thin and white, until at last the electricity will cease to be diffused through the column of air, and will appear as a glimmering light at the two points.

We have thus seen that this phenomenon, both in its appearance and its effects, partakes in a very marked degree of the electrical character. But the explanations respecting its origin are vague and indefinite. Electricity traversing the higher regions of the atmosphere is at the best all we as yet know of it. The scientific mind will see that there are many points to be settled and some difficulties to be overcome before we arrive at a correct appreciation of the circumstances by which its appearance is governed. We have many clues to the elucidation of its hidden mysteries, and we trust that scientific observers will give the matter their attention, so that we may yet clearly trace its origin and know the conditions which combine to produce these magnificent meteorological displays.

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FINANCIAL TRANSACTIONS OF THE WESTERN TELEGRAPH COMPANY.

Chicago, Nov. 30.—The *Tribune*, this morning makes an exposure of the financial transactions of the Great Western Telegraph Company, which has two lines in operation from this city—one to Milwaukee and one to Omaha—which, if true, offers something new in schemes for raising money. The *Tribune* says the capital stock of the Company is $3,000,000, in 120,000 shares of $25 each. Of the 120,000 shares, constituting the whole stock, 117,897 shares were subscribed by one Selah Reeve, and by him conveyed to Josiah Snow, in trust for the company, to sell the same and pay the avails back to Reeve. In fulfillment of the compact made by the company with Reeve, he was to construct two thousand miles of the company's line. In accordance with this the stock is being sold by the company throughout the country. One of the by-laws of the company provides that no certificates of stock shall be issued until forty per cent. of the whole shall have been paid in, and, as it is left entirely optional with the company as to when and how much of the assessments under forty per cent. on the stock may be paid, it seems probable that those who subscribe for stock on these conditions are likely to wait some time before they have any voice in the election of directors or the management of the company. This is the condition of the stock and property of the company. The names of twenty-two of the most respectable business gentlemen of this city are published as directors, and, though these have been formally elected by the company, it is alleged that none of them have been qualified as directors, and that they know nothing of its business transactions. Recently a suit has been brought by some persons in this city who subscribed for stock. They filed a bill alleging fraud in the contract made by the company with Reeve, in which it is agreed to pay him at the rate of $300 per mile for the line of poles, furnished with one wire, and an additional $100 per mile for each additional wire; $400 per mile when the poles are furnished with two wires; $500 per mile when furnished with three wires; $600 per mile when furnished with four wires. It is alleged that a line of poles with one wire can be erected for about $125 to $130 per mile. This allegation is sustained by the testimony of at least a half dozen telegraph builders of experience and established reputation. If, then, the company should pay Reeve at the rate of $300 per mile, it would leave a net profit of $440,000, and when he had furnished the full complement of four wires, making the total cost to the company of $600 per mile. The net profit of this contract would be about $700,000. The forty per cent. of money which the stockholders are to pay in before any certificates of stock are to be issued to them would amount to $1,200,000. This corresponds to the amount of the construction contract to Reeve at $600 per mile, which amounts to just $1,200,000. The construction contract and the payment on the stock are arranged so that the money paid in shall be paid out to Reeve before the stockholders have received any certificates of stock, or have any voice in the disposal of their money.

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INVENTION BY ACCIDENT.

In a recent number of a scientific journal, in an article entitled "Accidental Discoveries," it says:

"Not a few discoveries in the arts and sciences have been made or suggested by accident. The use of the pendulum, suggested by the vibrating of a chandelier in a cathedral; the power of steam, intimated by the oscillating of the lid of a tea-kettle; the utility of coal gas for light, experimented upon by an ordinary tobacco pipe of white clay; the magnifying property of the lens, stumbled upon by an optician's apprentice while holding spectacle glasses between his thumb and finger; the attraction of gravitation, as hinted to the philosopher Newton by the fall of an apple, are well known instances in proof of the fact. Galvanism was discovered by accident. Professor Galvani of Bologna, in Italy, gave his name to the operation, but his wife is considered as actually entitled to the credit of the discovery. She being in bad health, some frogs were ordered for her. As they lay upon the table, skinned, she noticed that their limbs became strongly convulsed when near an electric conductor. She called her husband's attention to the fact; he instituted a series of experiments, and in 1789 the galvanic battery was invented. Eleven years later, with that discovery for his basis, Professor Alessandro Volta, also an Italian, announced his discovery of the 'voltaic pile.'

"The discovery of glass making was effected by seeing the sand vitrified upon which a fire had been kindled. Blancourt says that the making of plate glass was suggested by the fact of a workman breaking a crucible filled with melted glass. The fluid ran under one of the large flagstones with which the floor was paved. On raising the stone to recover the glass, it was found in the form of a plate, such as could not be produced by the ordinary process of blowing. Glass pearls, though among the most beautiful, inexpensive and common ornaments worn by the ladies, are produced by a very singular process. In 1653 a Venetian named Jaquin discovered that the scales of a fish, called bleakfish, possessed the property of communicating a pearly hue to the water. He found, by experimenting, that beads dipped into this water assumed, when dried, the appearance of pearls. It proved, however, that the pearly coat, when placed outside, was easily rubbed off; and the next improvement was to make the beads hollow. The making of these beads is carried on to this day in Venice. The beads are all blown separately. By means of a small tube, the insides are delicately coated with the pearly liquid, and a waxed coating is placed over that. It requires the scales of four thousand fish to produce half a pint of the liquid, to which a small quantity of sal ammonia and isinglass are afterward added."

A tissue of errors more complete than that contained in the passage we have quoted, it would be difficult to find. That some discoveries have been made by accident we will not undertake to deny, but it is very certain that not a single one of those enumerated in the above passage are of the number. The pendulum was discovered by Galileo, who watched the chandelier simply because his mind was already occupied with pendulums and the laws of falling bodies. The power of steam had been discovered before tea or tea-kettles were known to Europeans; and when Watt sat watching the steam issuing from the spout of the tea-kettle, it was because his mind was already absorbed in investigations in regard to steam and the steam engine. That the first chemists used tobacco pipes to obtain gas from coal is true, but their doing so was no more accident than if they had used elaborate and costly retorts. The story of the discovery of the magnifying properties of the lens contradicts itself, for how are we to suppose that a spectacle maker's apprentice should discover the very property which had been long before utilized in spectacles themselves; in other words, magnifying power being the property for which spectacles are used, it is obvious that it must have been known long before any spectacle maker had an apprentice. The story of Newton and the apple never had any foundation in fact, and this has been so generally acknowledged that no respectable writer would attempt to revive it. Accident had nothing to do with Newton's great discovery, which was worked out by solid mental effort; but we could hardly expect this fact to be known to a writer who evidently does not know what that discovery was, since he calls it the discovery of the "attraction," a thing that was well known to Adam. Even the *laws* of gravitation were discovered before Newton's day. The story of Madame Galvani and her frog-leg soup, as usually given in the text-books, is a fabrication of Alibert, an Italian writer of no repute. Galvani had then been for eleven years engaged upon a series of experiments in which he used frogs' legs as electroscopes. The story about the discovery of glass making may do for a book of "Scientific Wonders, but will hardly pass with students of history; and the alleged origin of glass plate and artificial pearls rests on no better foundation.

Such mistakes, considered as mere mistakes, are not worth noticing, for they abound in our pseudo-scientific journals. We notice them here, however, because in this particular case their influence is peculiarly evil, as they tend to convey to young minds the idea that success depends upon "good luck" or "accident," or something of the kind, and not upon fair, honest, hard work. Now, in every one of the cases mentioned in the article from which we have quoted, it will be found that "accident" played the most unimportant share in effecting the result. Galileo, Newton, Galvani, Watt, Jaquin, and every discoverer and inventor of note, reached his results by hard study and steady application, and not by some mere accidental occurrence. Chandeliers had vibrated for ages and been watched by hundreds of listless and curious eyes without any result having followed. It was not the chandelier, but his mental training and study, that gave to Galileo the discoveries that have immortalized his name. Therefore, let our young readers, to whom this article is chiefly addressed, remember that as it has been in the past, so it will be in the future, and the measure of success attained, will, in general, be in exact proportion to the amount of judiciously directed effort that is expended. Accident may be very fairly left out of the count; to depend upon it is to lean upon a broken reed.—*N. Y. Technologist.*

From the Chemical News.

SUB-PERMANENT MAGNETISM EXPERIMENT.

The following experiment may be interesting or useful to some of your readers The object of the experiment is to produce, in a few minutes, what Dr. Tyndall has named sub-permanent magnetism; and thus represent to a class *quickly* what is effected by the earth *slowly* in soft iron lying in the magnetic meridian, and subject to molecular disturbance from percussion or other causes.

The requisites for the experiment are—a block of cast-iron (wrought-iron might, perhaps, do) slightly magnetized, a bit of soft iron wire, a hammer, and a magnetic needle for testing the wire.

Expt. 1.—Lay the iron wire on the block, and hammer it lightly from end to end, for a few seconds. Presented to the needle, the wire will be found magnetized, showing distinctly strong N. and S. poles, produced by the S. and N. poles of the block.

Expt. 2.—Place the wire *reversed* on the block, *i. e.*, lay the N. pole of the wire on the N. pole of the block, and hammer as before. Tested again by the needle, the wire exhibits its poles reversed.

Expt. 3.—Lay the wire as in Expt. 1, and hammer; the original polarity is restored. Finally, by chang- the position of the wire, the pole may be changed and rechanged as long as the wire lasts.

This experiment would seem to represent well the magnetizing action of the earth. The block personates the earth with its magnetism, which is not less comparatively than that of the cast-iron. Were the wire to remain for a considerable time lying on the block, it would be magnetized. The hammering effects *quickly*, in the whole wire, that molecular disturbance which is slowly, and piece by piece, produced in great masses of iron standing on the earth.

I am, &c., E. Kernan.

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THE TELEGRAPH IN CHINA.

Between Yeddo and Yokohama, as also between Osaka and Hioga, telegraphic connections already exist, which are worked in a very satisfactory manner, but by a system not used in Europe. The Japanese language is, as also the Chinese, a sign language, and has, besides, a pretty generally known alphabet, consisting of 42 signs, called the "Katagana Alphabet." Upon the disc used in telegraphing, four circles are made. In the inner one are the figures, in the next the European alphabet, and in the two outer mentioned circles the 42 Katagana signs. At the commencement of a message, a signal is given calling attention to which circle is going to be used; so that, in telegraphing either in the Japanese or European language, but one disc is requisite. No alphabet exists in the Chinese language, but each word has a particular sign, which have all been derived from 214 root signs. In order to transmit messages written in the Chinese language, the Company has arranged tablets of the commonly used words numerically arranged, so that by aid of these tablets, and sending the number of the receiving station, the Chinese characters are sent.

◆

The Anglo-Australian Telegraph Cable.—The following telegram has been received in London by the Telegraph Construction and Maintenance Company from Captain Halpin. It came from Singapore to Galle, whence it was forwarded at 10 p.m. on the 21st inst.: "The Java-Singapore Section Submarine Telegraph Cable successfully completed on the 18th inst. Proceed on the 28th to lay cables to Penang and Madras. All well."—*Engineering.*

THE MORSE STATUE.

After the recent plantation at intervals about the town of Dutch shrubbery in bronze in the shape of unrecognizable effigies of unmemorable persons, it is gratifying to know that we are to have in New York what promises to be a worthy commemoration of one New Yorker. The early worthies of the city have no recognition in it. We have left it to Boston to put up a statue of Alexander Hamilton, which Boston has done in ugly granite, and thereby induced in the juvenile Bostonian mind the belief that that statesman, if he did not actually fall at Bunker Hill, must at all events have belonged to Boston on his mother's side. But we have still among us men who deserve and demand from New York all the civic honors she has to bestow, and Professor Morse is clearly of them. The æsthetic and the commercial communities are under an equal and an important debt to him. It is nearly fifty years since he was chosen first President of the Academy of Design, which, in spite of all that may be justly urged against its conduct and its consequences, remains the chief, as it is the oldest, of the repositories and schools of the fine arts in America. And it is nearly forty years since he elaborated the system of communication which has created modern journalism, in Europe as well as in America, and contributed in an abundant measure to the prosperity of the city in which he still survives. There is no question at all as to the claims of such a man upon that peculiar homage of his townsmen which is implied in the erection of a statue to him. But there is the dissuasive consideration that our statuesque homage is too apt to be carved or cast ridicule, and Professor Morse has surely not deserved at our hands that we should make of him

> "A fixed figure for the time of scorn
> To point his slow, unmoving finger at."

From such a fate those who have inspected the model for the statue of Professor Morse have found that he is exempt, and that his memorial is likely to prove one worthy of the man and of the metropolitan pleasaunce—which, it is to be hoped, it will go to make the nucleus of a metropolitan pantheon as well—in which it is to be erected.—*N. Y. World.*

◆

Telegraphy in the West Indies.—A line of telegraph between Georgetown and New Amsterdam, part of the undertaking of the West India and Panama Telegraph Company, is in course of construction. By the last mail engineers arrived with instructions to commence the construction of a land line from Pomeroon to Georgetown; but the difficulties in the way of landing a cable at the Pomeroon are so great that Mr. Mason, the local agent of the Company, has represented them to Sir C. Bright; meanwhile Mr. Mason is pushing on the line to New Amsterdam, which in any case will have to be constructed.—*Engineering.*

◆

In the matter of meteorology, the Americans are doing good service. They are endeavoring to establish a thorough and far-reaching system of study of storm phenomena. Industry, humanity, and science will all benefit from the enlightened labors of the American authorities who have taken up this matter. The disclosures touching storm signals are very interesting. In September, 1863, the fleet at Toulon had four hours' warning of a gale, which, by acting upon the warning, it rode out in perfect safety. Italy was also warned at the same time, and there, as in France, officers on shore were ordered to their vessels, and authorities on shore took measures to see that merchantmen should be able, or at least warned, to meet the gale.

It is gratifying to notice the degree of success that has attended the application of science in this department. In England, for instance, under the direction of the accomplished and lamented Admiral Fitzroy, 50 per cent of the prognostications of 1863–64 were verified, and 78 per cent of those of 1864–65. Of 100 warnings sent to the coast of France in the winter of 1864–65, 71 proved correct, and in the following year 76 in the 100 were justified. The efficiency of the observers, as may be expected, improves from day to day. In the first of the winters referred to, the storms foretold were 80, and in the second, 94. In this matter of storms, future scientific accuracy may be reasonably expected. Great advances have been made in relation to the building, sailing, and steering of ships, and to finding their positions at sea; it is to be hoped that increased attention and enlarged knowledge will distinguish the labors of the experts whose scientific powers are applied to the subject of storms. By the system elaborated by Admiral Fitzroy, 32 reports are received daily from the United Kingdom, and 5 from the Continent. These are based upon details of barometrical and thermometrical observations, and upon the direction and force of the wind, the differences between the wet and dry bulb, condition of the sky, the amount and time of falls of rain and snow, and sea phenomena or disturbance.—*Mechanics' Magazine.*

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Mount Washington, Hamilton Co., Ohio.

To the Editor of the Journal of the Telegraph.

Sir: I have just perused an article in your valuable paper of November 15, 1870, from the pen of George B. Prescott, which I regard as a very concise, practical, and valuable paper, on the Automatic System of Telegraphing recently patented by Mr. Little, as well as other methods of automatic sending. My attention no doubt has been more earnestly enlisted in the matter, as recently I too have been inventing. My invention consists in a double line alphabet, made by a double Morse registering instrument, containing two pens, two levers, and two magnets, operated upon by the sender of a message with two keys, insulated from each other, side by side like two piano keys. Each key is constructed similar to the ordinary Morse key. Thus equipped, I am enabled to transmit messages at the rate of three to one over the present single line alphabet or Morse system, whether by automatic or other means. It is said that forty words per minute may be written on the single line system; the same expert would write 120 words per minute with the double alphabet, and read by sound.

Respectfully yours,

H. C. Nicholson.

The apparatus above described would require two wires instead of one, which would be a serious objection to its practical use between very distant places. We must express our doubt as to the ability of any expert to manipulate two keys so as to transmit 120 words per minute, and also as to the capacity of the human ear to distinguish sounds representing letters when made at the rate of more than 600 per minute. We are afraid the plan is not practicable.

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Academy of Science and Art.—*Washington, D. C.*—The regular monthly meeting of the American Academy of Science and Art was held at their rooms last evening, Judge Thomas W. Bartley, Thirp Vice-President, in the chair.

The department of fine arts passed upon a report submitted to them on the subject of erecting a monument to Professor Morse, Inventor of the Magnetic Telegraph.

The following resolutions were adopted by the Academy:

Resolved, That the Academy regards the erection of a monument, at the seat of the National Government, to commemorate the invention of the Magnetic Telegraph by Prof Morse, as an object strongly commending itself to the just national pride of the American people, and worthy of encouragement and support.

Resolved, That the design for the suggested monument submitted by Dr. Horatio Stone, appears to the Academy to be eminently appropriate, and deserving of the consideration of the subscribers to the monument fund

THE SERVICE.

WESTERN UNION TELEGRAPH COMPANY.

EASTERN DISTRICT.

APPOINTMENTS DURING OCTOBER, 1870.

Geo. Bascom	5th Avenue Hotel, N. Y.
T. J. Bishop	145 Broadway, N. Y.
E. Drenba	145 Broadway, N. Y.
Miss A. Hodgins	145 Broadway, N. Y.
Miss A. B. Hibbard	145 Broadway, N. Y.
E. H. Kearney	145 Broadway, N. Y.
W. A. Seymour	Gold Room, N. Y.
James W. Wallace	Penobsquis, New Brunswick.
Robert J. Frieze	Westfield, New Brunswick.
Miss C. H. Snow	Portsmouth, N. H.
Charles Bodwell	Solon, Me.
A. Quimby	Littleton, N. H.
J. T. Flint	Derby Line, Vt
J. O. M'Farland	Warwick House, Boston
C. D. Stanford	Main Office, Boston.
Miss C. S. Crocker	Main Office, Boston.
Miss C. E. Smith	Chelsea, Mass.
Russell Mallett	Sharon Springs, N. Y.
John D. Sickel	Baltimore, Md.
W. C. McCandless	Lancaster, Pa.
Miss Lulu Smith	Lebanon, Pa.
W. H. Garland	Philadelphia, Pa.
L. Ruan	Riverton, N. J.
James F. Morrison	Washington, D. C.
Irvin Risley	Harrisburg, Pa.
Charles A. Brown	Volcano, W. Va.

TRANSFERS.

C. D. Stanford	New York to Boston.
G. W. Waldron	Lake Mahopac to New York.
Samuel M'Cready	Penobsquis, N. B., to Palmee, N. B.
D. E. Rand	Caldwell, N. Y. to Fitchburg, Mass.
Miss C. S. Crocker	Chelsea, Mass., to Boston.
Chas E. Chesebro	Auburn to Syracuse, N. Y.
R. A. Gager	Niagara Falls to Rochester, N. Y.
Thomas J. Tobin	Syracuse to Auburn, N. Y.
W. E. Yachley	Lancaster to Jersey City, N. J.
John Hartman	Lebanon to Wilkesbarre, Pa.
W. G. Wilkie	Philadelphia to Washington, D C.
James H. Buchanan	Wilkesbarre to Morristown, N. J.

RESIGNED.

Miss E. Blanchard	operator	145 Broadway, N. Y.
J. P. Cassiday	operator	145 Broadway, N. Y.
W. E. Dulie	operator	145 Broadway, N. Y.
Miss L. M. Fain	operator	145 Broadway, N. Y.
William D. Barclay	operator	Westfield N. B.
E. O. Cole	manager	Portsmouth, N. H.
T. Briswell	operator	Solon, Me.
J. E. Demick	operator	Littleton, N. H.
E. A. Smith	manager	Fitchburg, Mass.
E. H. Thresher	operator	Saratoga, N. Y.
Horace Washburne		Boston, Mass.
R. G. Crapo	operator	Newport, R. I.
P. W. Bassart	operator	Boston, Mass.
James W. English	operator	Niagara Falls, N. Y.
E. A. Mead	operator	Rochester, N. Y.
William H. Pusey	operator	Jersey City, N. J.
Harry H. Dillon	manager	Riverton, N. J.
A. R. Adams	operator	Washington, D. C.
William Curren	manager	Morristown, N. J.

◆

A Telegraphic Invention.—A friend behind the scenes has favored us with a peep at an ingenious piece of telegraphic mechanism, invented and just completed by our esteemed and enterprising fellow-citizen, David Flanery, Esq., Superintendent of the Western Union Telegraph Company's affairs here.

The "relay" is made to perform functions not previously deemed within the range of possibility. By a single electrical impulse, imparted by a touch of the finger, the dial-wheel and two armatures are set in motion, and with little additional attention, the instrument sends out nicely printed messages upon a strip of paper passing with easy regularity through the works of the machine.

This invention, we think, is a triumph of genius and skill of which our respected townsman may well feel proud. It is designed for office and counting-room service, and may be guided by the most inexperienced hand, after a lesson of five or ten minutes.

To work the style of instrument heretofore in use it has been found necessary to run as many as three wires between the points communicated with one another. To work Mr. Flanery's invention there is required but one wire.

We understand it is the intencion of the inventor to have the work patented and submitted to the public at an early day.—*N. Orleans Picayune.*

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Messages for Enterprise, Pa., should be addressed to South West, Warren County, Pa.

DOWN AMONG THE DEAD MEN.

Among our earliest telegraph companions was Gen. Zook, the subject of the following sketch, which we take from a recent number of the *Old Guard*. No one ever proved a more devoted or generous friend. He was every inch a man. There was not the dust of meanness on or about him. When he fell at Gettysburgh, we felt that a gallant heart had stopped its beating, and a true soldier had left the ranks.

It may seem strange, yet the first vigorous oath we ever heard from him, and his oaths were very peculiar, was occasioned by us. Early in 1846 the wire had broken east of Philadelphia. Zook and we ran that office, and Zook being the junior, and we in command, he had to mend the break. We had no repairers these days. We did our own repairing. So off went Zook, with three dollars to pay expenses, a coil of wire, and all the material of war in such cases provided. When he reached the break we directed him to find or make a puddle of water, to stand therein, and, by using a small piece of wire inserted in the water, tapping on the broken end to inform us of his arrival. He was then to put the wire on his tongue and get our acknowledgement. On he went. There were 80 Grove cups stewing in the battery room with fresh nitric and sulphuric 1 to 10 of water. By and bye we heard Zook calling us. He was standing in a good pond of water, according to orders. About the time when we supposed he had the wire snugly on his tongue we gave the key a wicked snap together and the requisite number of strokes and waited for about five minutes.

"Not a drum was heard nor a funeral note—"

In course of time, however, came words to us slowly and steadily which made our hair stand on end. Oh! how he swore! We had knocked him square over in the mud, amidst the laughter and fright of a hundred or more amazed Pennsylvanians who thought him crazy. At night he came into the office covered with mud from head to foot. Poor Zook! His oaths were part of himself. When we at one time begged of him to break the habit, he replied characteristically: "It is kuss or bust." So we never complained. And now he is gone we feel as if we had lost part of our old life. But to the sketch:

SAMUEL K. ZOOK.

From the Old Guard.

The only officer in the Federal side during the late war, for whom I felt any regard, was the late General Zook; and as if to intensify my feeling towards him, he has met with no posthumous honors, while his inferiors in soldierly qualities have their monuments, and are the subjects of panegyric. But then Zook robbed no non-combatants, made no levies on plate chests, openly gave his tribute of applause to the courage and honorable motives of his antagonists, forced his subordinates, down to the lowest private in the ranks, to observe the laws of war, and never pretended that he went into the war through any patriotic impulse. He was a soldier by instinct, and through study; a stern and steady officer, who knew his duty and made all under his command do theirs. Though through the hardest battles of the Peninsula, in nearly every fight commanding as the senior Colonel the hindmost brigade of the rear division, "the post of honor in a retreat," he was overlooked in the promotions, until Sumner and other regular officers, who saw in him the born soldier, demanded his star, and Lincoln sent in his name to the Senate. He entered the war through a passionate love for the military profession, and finally fell on the bloody field of Gettysburg, where his courage and coolness stood conspicuous, meeting death with the quiet and steady bearing that had marked him all through his career.

But I knew less of Zook, the soldier, than Zook, the man. He was the truest and the best, the most unselfish and devoted friend that I ever had, and as I look on the faded letters before me, some of them from camp and battle-field, and others long anterior to the war, I stop writing from sheer emotion. Poor Zook! The last time I saw him alive he was on sick furlough, badly crippled with rheumatism, and came to spend a week at my house. He had been there only a couple of days when the news came of the threatened invasion of Pennsylvania, and he made ready to go. I remonstrated.

"You are not fit to go, Sam. You can scarcely sit in the saddle—certainly you'll have to be lifted in it. Besides, your term of leave does not expire for a week."

"True; but they have given me my brigadier's commission, and I should be unworthy of it, if I were not in the field at a moment like this."

Go he would, and when I next saw him it was in his coffin, at the City Hall, in New York, where he lay in state. As if to cheat him of even the poor honors of a funeral pageant, the riots broke out that day, the pomp of a military burial was not given, for the troops were needed elsewhere; and Zook was sent to his grave in Greenwood without more ceremony than that given to a stranger—his venerable father and his brothers, with a few more, accompanying the remains.

Zook, for a long time was connected with various telegraph lines of the country, as operator, constructor, and superintendent, and was the author of many valuable improvements. He filed a caveat at Washington for telegraphing across rivers without wires, using the water as a conductor, and the experiments made in perfecting matters for his patent were very striking and satisfactory. And we think he was also the inventor of another important matter in its way—swearing by telegraph.

Whilst I was residing in the western part of Virginia, I had occasion to communicate with Zook about some business operations in which both were concerned, and to do it more readily went up the river to Wheeling, and thence to Pittsburg. There I went into the operating room of the telegraph office, and asked the operator to inquire if Zook was in New York, and to advise him of my presence. The operator, who had expected my coming, clicked a message, and at the first taps in return, laughed.

I looked surprise, and he enlightened me.

"That's Zook himself at the other end of the line. Listen!"

He translated the taps, which were of course incomprehensible to me, and sent my messages in return. Thus, by deputy, I kept up a conversation of an hour or more, interrupted at times by business messages.

When we got through, I asked the operator how he had recognized Zook so easily.

"Well, partly by his style. He is a very bold, clear, and decided operator; but by one peculiarity of his. I got your name wrong in the message, and the answer came back saying it was not —— but ——, and the message began with a rather profane ejaculation. Zook is known all over the line as 'the man who swears by telegraph.'"

"Curses the stupidity of some of the operators, eh?"

"Oh, no! he's perfectly impartial. He flashes his curses at presidents and superintendents, and any one that rouses him."

The reader must not infer from this that Zook was a habitually profane man. He was nothing of the kind, though he could almost equal Horace Greeley in his ability to say his prayers backwards, if provoked. But though he could swear, it was the mere ebullition of the moment, provoked by the fraud or folly of others, the impulse of a warm, and impulsive and generous nature; and he could neither lie, desert a friend, nor perform a dishonorable action. These were things utterly impossible for him. Our friendship grew slowly, but once formed it never varied for years. Much as I loved him, I was not blind to his faults; but they were few, and frequently merely distorted virtues. I had friends before him, had them since, and have three now whose friendship is honor; but never had, have not, and do not expect to have any such as he.

◆

The Cuban cable shows a fault between Punta Rassa and Key West, yet continues working and transmitting all of the Company's business.

◆

We acknowledge receipt of the annual report of the Chief Signal Officer at Washington, to the Secretary of War, through the politeness of Gen. Myers, but too late to refer to its contents.

◆

The Bona and Malta cable has been laid.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 2,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, DECEMBER 15, 1870.

NO DIVIDEND.

It was deemed inexpedient by the Board of Directors of the Western Union Telegraph Company, at their regular semi-annual meeting, December 8th, to declare the usual January dividend. The effect of this decision was to cause a rise in the market value of the stock of three per cent. It shows a determination to hold a firm hand upon the property of the company and increase its value. As an old New Yorker puts it, it is the difference between a dividend and stock at 36 and no dividend and stock at 46. He was a sensible man. We cannot place it better before our readers. Yet it will puzzle some, no doubt, to understand why a dinner should be better because they don't get it. Let all such be patient. Dinner will be ready in good time.

◆

THE TELEGRAPHIC EDUCATION OF WOMEN.

It might readily have been anticipated that a system of communication such as the telegraph presents, so simple, so clean, so apparently domestic, so easy of acquisition, would early attract the application of woman's labor in its development. We have claimed to have been the first to appoint a woman to telegraph duty, and feel somewhat gratified, of course, that we bear such an honor. Our selection at least has always been honored by the lady appointed, although she may have forgotten us. Yet we believe we were indebted to herself for the suggestion of the appointment. We remember well that the wires were introduced into a neat sitting room of a home in Westchester, Pa., where, with the instrument on one side and a work basket on the other, our new assistant sent and received her messages, and filled up the interim in fixing her Sunday bonnet, or embroidering articles of raiment which a gentleman editor is not expected to know or name. It was an appointment of great value to the service. Men left alone are inclined to be blackguards. It is only necessary to go into a railroad smoking car, or into the gentlemen's cabin of a ferry boat, to see what a hog a man is. So even on a telegraph wire, where one would think the daintiness of the machinery and service, and the spaces which separate those engaged in its labors, would prevent it, there creeps in an amount of vulgarity which seems inseparable from exclusively male service. Being of that persuasion ourselves, of course, we accept the statement of our own weakness. The appointment of a single woman to the management of an office on a circuit at once changes this. There is an instinctive delicacy at once excited, and courtesy, and forbearance, and respect at once show themselves. Of course, the more refined the woman, the more marked the influence.

Partly from this, and partly from the intelligent recognition of her adaptation to telegraphic labor, women are being rapidly introduced into telegraph offices where they are usually connected with either minor offices, or of auxiliary wires. So much have they been needed, indeed, that every graduate of the telegraph school conducted at the Cooper Institute under the able management of Miss Snow, have found employment as soon as they graduated. It is in the nature of things that this demand should, to some extent, continue. These ladies, in the ordinary course of nature, must in time become the lights and managers of homes.

We had the opportunity, a few days ago, of witnessing the Cooper telegraph school in operation. Twenty-three young girls, averaging sixteen years of age, sat at the various desks endeavoring to send messages to each other. It was interesting to notice the progress each had made, and it was comparatively easy to tell which would succeed. The easy touch of the key, the depression of it without excitement of the head or body, the sharp introduction of the dot after a dash, as in the letter n, or d, or j, all indicated the operator. We cannot suppress the thought, however, that it is a mistake to learn an operator without the use of the register. An operator should be compelled to make letters exact; and to do this, they must be seen. Such, at least, is our conviction. Once thoroughly drilled in the formation of letters, they are never afterwards forgotten. And yet we confess to the excellence attained at this school, and the correct manipulation manifested by its graduates.

Over fifty graduates have now left Cooper Institute, and have the management of offices or serve in them. The classes are now doubled from their original size, and over fifty may now graduate annually. Whether the demand will increase with the capacity of the school remains to be seen. Pupils are dismissed who, after four months' practice, display a want of aptitude in transmitting or receiving. Of the present class only two are regarded as doubtful. All we saw seemed intelligent and diligent.

The room occupied for the school is comfortable, well lighted and aired. Every duty connected with a telegraph office is carefully taught, such as book-keeping, care of batteries, counting of words, preparing reports, &c., so that to graduate from the school is to be eligible for appointment. We think that in the very nature of the business the service of women in connection with the telegraph must be largely increased, and that, too, without reducing the service of men.

We regret to receive the following note from Chief-Justice Chase, to whom we had sent an invitation to deliver the inaugural address at the unveiling of the statue of Prof. Morse:

NARRAGANSETT, December 8, 1870.

MY DEAR MR. REID: It is too doubtful whether I shall be able to speak to any audience on the 27th of April next, to permit my acceptance of your invitation to deliver the address upon the unveiling of the statue to Professor Morse. The statue is an honor really deserved, and I hope with you that the occasion will be marked by a "national and impressive celebration."

My health seems to be mending, but its restoration must necessarily be slow. Very truly yours,

James D. Reid, Esq. S. P. CHASE.

◆

AN UNPUBLISHED LETTER.

A correspondent in North Carolina writes us respecting an electric fact, which, though familiar to engineers, is little known, yet curious and interesting. The statement of it by our correspondent is so clear that we regret his request to avoid its publication, and it has additional interest from the fact that it is the result of personal examination.

The direct occasion of the letter was the peculiar working of the French cable, which is represented as transmitting with greater facility to France than from it. To the writer this suggested two things. First, that a leak existed; and second, that it might be closed by the direction of the current. Unfortunately, the current passing through Atlantic cables is so infinitesimal, that practically it could exert no such influence either for good or bad.

The fact, however, is curious and interesting. When a cable is injured, and a portion of the copper of the core exposed, by directing the positive current of the battery toward it through the cable, an active chemical action is at once excited by the triple contact of the current, the copper and the sea, chlorine and oxygen so uniting with the copper as to deposit on the surface of the latter a greasy substance having non-conducting qualities. Where a strong battery can be employed, this fact is, of course, very important, and of which telegraph engineers have not been slow to avail themselves. We mention it now as one of the results of the critical examination of electrical processes which lead to the most important results, and which has arrested the attention of one who lays no claim to enlarged electric knowledge.

And the converse is of equal interest. If the negative current be employed, the action is reversed. In the formula of our correspondent, which is sufficiently accurate, "hydrogen and sodium are taken up, the sodium goes to the wire, the hydrogen escapes and the water enters without obstruction," nay, by invitation.

By facts of this nature, results affecting the value of property of immense cost are evolved. The location of faults in our Atlantic cables with mathematical precision, is one of the most marvellous products of recent scientific precision and inquiry, without which capital invested in cables would be in the utmost peril, and should act as a stimulant to all companies to encourage thoughtful men in the patient investigation of the vast field now opening to the race by the discovery of the electric forces which evidently permeate all material things, and which may yet enter realms undreamed of by our philosophy

WESTERN UNION TELEGRAPH COMPANY.

OFFICIAL STATEMENT.

	October. 1869.	October. 1870.
Receipts	$638 926 74	$678,665 95
Expenses	437,533 43	453,250 24
Net profit	$201,393 31	$221,415 71

◆

THE HOLIDAYS.

Western Union Telegraph Company,
Executive Office, 145 Broadway, N. Y.,
December 13th, 1870.

Executive Order No. 113.

On Monday, the 26th inst., and on Monday, January 2d, 1871, office hours will be from eight to ten o'clock, a.m., and from four to six o'clock, p.m., except at repeating stations and principal offices, which will be kept open as usual, but with such reduction of force on duty as circumstances may permit.

William Orton, President.

◆

ANSWERS TO CORRESPONDENTS.

The original and amended Rule Six makes no provision for messages received from distant points, many of which contain numbers that are not "written out."

To us who have considerable river business this is the occasion of much inconvenience, especially when telegrams are sent us in sealed envelopes, and bearer will not assume the responsibility of making necessary changes. Cannot this be remedied until the rule becomes more generally observed?

Again, all receivers are forbidden to erase figures. Does this apply when we are requested to do so by a customer, or does it restrain the latter from doing so himself?

Whenever a message is received from a distant place by mail, express, or other similar conveyance, containing answers written in figures, and not duplicated in words, the manager will write the amount in words and transmit them to their destination, provided the figures are plainly and legibly written. Of course, the figures should not be written out, nor transmitted, unless their identity is clearly established.

Receivers should not make erasures of figures except where the customer is unable to do so; in which case a memorandum should be made on the margin of the message, stating that the erasure was made at the request of the sender.

Our rules cannot of course restrain a customer from making any alterations in his dispatch that he pleases.

◆

The cable of the Falmouth and Malta Telegraph Co. has been disabled near Lisbon.

◆

The Guernsey and Alderney cable has been restored.

◆

The two cables of the Anglo-American Telegraph Co. still remain disabled, the weather not favoring the work of restoration.

◆

The French cable still shows a serious fault, but yet passes a large amount of business. To prevent overcrowding, and consequent delay in transmission, the rates have been increased, press messages paying full rates and the quantity limited.

◆

The second cable between Malta and Alexandria is being laid.

◆

The laying of the cable from Batavia to Singapore was to commence December 7, and has already been reported as laid. The cables to Penang and Madras were expected to be complete by Christmas.

◆

Eleven hundred miles of the Chinese cable are ready for shipment at Greenwich.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
December 16, 1870.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Dec. 1, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

147	Au Sable, Mich.
148	Alabaster, Mich.
84	Ashland, Pa., heretofore an other line office.
231	Brownsburg, Ind.
466	Burlington, Ks.
351	Como, Miss.
351	Cold Water, Miss.
289	Covington, Ind.
454	Crawford, Iowa.
428	Calhoun, Mo.
180	Dennison, O.
148	East Tawas, Mich.
305	Evans Mill, Ala.
*	Homer, La.
476	Humboldt, Ks.
	Jeddo, Pa., tariff same as and check, Hazelton, Pa.
230	Kawkawlin, Mich.
	Medicine Bow, Wy., heretofore an other line office, tariff same as Rawlins, Wy.
438	Nevada City, Mo.
476	Neosho Falls, Ks.
89	Port Clinton, Pa., heretofore an other line office.
318	Philo, Ill.
438	Rockville, Mo.
37	Russell, Mass.
148	Rifle River, Mich.
66	Schuylkill Haven, Pa., heretofore an other line office.
318	Sadorus, Ill.
130	Sheridan, N. Y.
148	Tawas City, Mich.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.	*Leaves this Line.*
Keswick, P. O., Ont.,	same as Berlin, Ont.	same as Berlin, Ont.
Homer, La.,	50 4	Minden, La.

OFFICES CLOSED.

Hackensack, N. J.; Hickory, Miss.; Maysville, Ill.; Montague, Mass; and North Pownal, Vt.

GENERAL INFORMATION.

Etna and McLean, N. Y., will hereafter be checked as other line offices. Tariff 25 and 2 from Ithaca, N. Y.

Business for State Line, Mo., should be sent and checked to Kansas City, Mo. Tariff same as Kansas City.

All offices that are now taking "half rate" (red) messages are hereby instructed that on and after January 1st, 1871, they will take for, and receive from, all offices of the Montreal Tel. Co., messages at half rates, subject to the rules governing such business on W. U. lines.

The tariff to squares 147 and 148 will be as follows:

Square 147—20 cents more than to square 230, and
Square 148—10 cents more than to square 230.

Carr Station, Evans, and Hughes, Colorado, will hereafter be checked direct, tariff same as heretofore.

OFFICES HAVING "SPECIAL SHEET A."

Will hereafter check Reading, Pottsville, Ashland, Centralia, Mount Carmel, Mahanoy City, Shenandoah City, Hamburg, Schuylkill Haven, Lebanon, and Pottstown, Pa., 15 cents more than "special rate" to Philadelphia.

ATLANTIC CABLE BUSINESS.

We are notified by the Cable Companies of the following changes in rules, to take effect at once:

In ordinary messages, figures and letters *having no secret signification* are counted as follows:

Every group containing five characters or less counts as a word, beyond five, and up to ten, two words, and so on. Any isolated figure or letter counts as a word.

Decimal points, commas, and bars of division, used in conjunction with figures or letters, in such messages, are counted each as a figure.

The comma or dash *separating different groups* is not counted or transmitted, but commas or dashes inserted by the sender, and forming part of a group, are counted and transmitted.

The receiving clerk must ascertain whether commas and dashes belong to groups or are used merely to separate them.

Several quotations of stocks, numbers and prices of goods, &c., cannot be combined in one group, unless the message is paid for as cipher, at double rates.

Underlines.—When words are underlined, each underline counts as one word.

Prepaid Replies.—Should the reply contain more than the number of words specified and paid for, the sender of the reply must pay for it as a fresh message at regular rates; and the amount deposited for the reply by the sender of the original message will be returned to him. Should the reply be presented later than eight days after arrival of original, it must be paid for as a fresh dispatch.

We are notified that the Falmouth cable is broken between Lisbon and Gibraltar. Messages for Gibraltar, Malta, Egypt and India cannot be sent by that route until further notice. Messages for Egypt and India should go "via Malta," and for Gibraltar "Post San Roque."

WILLIAM ORTON, President.

MORSE TESTIMONIAL FUND.

As we close this issue, over $7,000 is in our hands. We are happy that we are able to state that the final cost will be one thousand dollars less than the amount stated in our circular. $2,500 only are needed to complete the work. Of this we will personally undertake the collection of one thousand dollars, which represents the cost of the base. Thus $1,500 only remains to be provided from operators and their friends. Does any one believe that this will not come? When the veil is taken from that statue on the 27th of April next, not a dollar will be due upon it, not one! And that statue will stand upon the grassy mound designated for it, a memorial not only of a grand old man who has honored his country alike by his genius and his character, but of the heart and magnanimity and intelligence of the operators of the American continent.

RECEIVED SINCE LAST ISSUE.

W. W. Smith, Vice-President Cin., Ind. and Laf. R. R.	$25 00
J. R. Williams, Jr., manager, Austin, Texas	5 00

FROM THE FAR SOUTH.

Monroe, La., Nov., 1870.

Dear Sir: Inclosed find $55 75, second contribution from the Tenth District, Southern Division, for the Morse Statue. If necessary, "*come again!*"

Yours, C. W. Montgomery, Manager.

Wm. A. L'Hommedieu, supt., Monroe, La.	$3 00
C. W. Montgomery, opr., Monroe, La.	2 50
J. J. Guthridge, operator, Monroe, La.	2 50
R. Q. Sevier, opr., Monroe, La.	2 50
J. H. McEachern, opr., Jefferson, Texas	2 50
Dave Campbell, opr., Jefferson, Texas	2 50
J. M. Morrison, opr., Marshall, Texas	2 50
J. H. Bright, opr., Marshall, Texas	2 50
G. J. Rae, opr., Shreveport, La.	2 50
W. D. West, opr., Shreveport La.	2 50
J. A. Bennett, opr., Hallville, Texas	2 50
Jno. T. Hull, opr., Camden, Ark.	$2 50
M. Wilder, opr., Minden, La.	2 50
Aylmer Bright, opr., Minden, La.	2 50
J. M. Colvin, opr., El Dorado, Ark.	2 50
J. W. Hudson, opr., Trenton, La.	2 50
William Welch, opr., Vienna, La.	2 50
J. P. Morrison, opr., Delhi, La.	2 00
A. T. Lott, opr., Farmerville, La.	2 50
P. McLemore, opr., Delta, La.	2 50
R. T. Shores, repairer, Monroe, La.	2 50
J. G. Sabine, messenger, Jefferson, Texas	1 25
	$55 75

Thanks for that "come again." It brought the tears.

BANGOR, MAINE.

Hurrah for Bangor! Here she comes on a run Dunkirk a little ahead, and Texas, Arkansas and Louisiana putting in with long strides for the Morse Testimonial:

SECOND SUBSCRIPTION.

Charles E. Bliss	$5 00
F. A. H. Pillsbury	5 00
Charles I. Collamore	5 00
Edward O. Chase	4 00
A. F. Pillsbury	3 00
David G. Stone, repairer	$2 00
Frank J. Temple, messenger	1 00
Lewis H. Albrecht, messenger	1 00
	$26 00

If a third subscription is necessary, give us a hint!

PHILADELPHIA.

SECOND SUBSCRIPTION

J. D. Maize	$1 00
E. L. Maize	1 00
Hugh McAleer	1 00
A. P. Eastlake	1 00
D. H. Bates	1 00
J. Merrihew	1 00
H. Bentley	1 00
G. W. Porter	1 00
W. G. Jones	1 00
Geo. D. Mantl	$1 00
Wm. Carley	1 00
E. C. Deery	1 00
John Monroe	1 00
W. T. Buckwell	1 00
D. A. Curl	1 00
J. Shive	1 00
H. C. Robinson	1 00
	$17 00

THE ERIE LIST.

The noble list of the Erie District exceeding, with the present list, $500, is completed with the following names. This success was accomplished by a generous heading by Mr. Holmes, and then forwarding the list from office to office.

Frank Moore	$5 00
J. A. McDuffie	3 00
C. A. Judd	1 00
Geo B. Allison	1 00
W. K. Dewitt	2 00
A. H. Babb	2 00
C. B. Hadley	1 00
S. E. Weld	1 00
J. M. Stambach	1 00
B. W. Plum	1 00
J. B. Lewis	1 00
F. Jeffries	1 00
A. J. Carter	1 00
J. B. Stearns	$1 00
E. S. Dunning	2 00
J. H. Wise	2 00
O. A. Slocum	1 00
A. S. Dayton	1 00
A. V. Hill	1 00
W. H. Walruth	1 00
Jas. Kennealey	1 00
Pat. Maloney	1 00
Alfred Crone	1 00
H. B. Gray	1 00
Chas. T. Goodrich	1 00
	$35 00

The Erie Division has done a noble work.

ATLANTA, GEORGIA.

Dear Sir: Inclosed please find ten dollars. Better late than never.

Yours, J. Herrick.

A. W. York, Marietta, Ga.	$1 00
D. P. Askew, Barnesville, Ga.	1 00
Philo Holcombe, Atlanta, Ga.	1 00
J. E. Lyons, Atlanta, Ga.	$1 00
E. J. Stevenson, do	1 00
J. M. Stephens, do	1 00
J. Rolston, do	1 00
J. Herrick, do	3 00
	$10 00

PENNSYLVANIA.

Friend Reid: Here are some gentlemen along the Philadelphia and Erie line who wish to be represented in the Morse Statue. Hope they are welcome.

Yours, H. A. Clute.

J. C. Duggan, manager, Renovo, Pa.	$1 00
W. Irwin, chf opr., Middle Div. P.& E R.R., Renovo	1 00
J. F. Davis, train dispatcher, P. & E. R. R., Renovo	1 00
J. H. Coffine, agent and opr., Renovo	1 00
R. J. Cully, opr., Renovo.	1 00
Frank Boyle, manager, W. U. T., Round Island	$1 00
D. Good, manager, Johnsonburg	1 00
G. H. Boyd, manager, Wilcox	1 00
J. M. Haines, manager, Keating	1 00
R. G. Haynes, manager, North Point	1 00
	$10 00

All welcome, every one of you.

COLLINSVILLE.

Dear Sir: We want the statue to be a success. Here is our mite.

Yours, Geo. H. Barbour.

George H. Barbour, manager	$1 00
Porter A. Wheeler, opr.	50
Walter J. Sondant, opr.	$ 50
	$2 00

KANSAS.

Dear Sir: Inclosed find $5 50 to get the "bronze." Expect a second response before long. We are few, but "healthy."

Respectfully, F. C. Jones.

F. C. Jones, mgr, Wetmore, Ks.	$1 00
C. Cochrane, supt. R. R., Atchison, Ks.	1 00
Asa P Baldwin, manager, Centralia, Ks.	1 00
L. T. McMullen, manager, Frankfort, Ks.	1 00
Rising & Son, Wetmore, Ks	50
William Muir, citizen, Wetmore, Ks.	$ 25
J. W. Graham, citizen, Wetmore, Ks.	25
Hugh Fortner, citizen, Wetmore, Ks.	25
M. P. M. Cassity, citizen, Wetmore, Ks.	25
	$5 50

PHILADELPHIA, PA.

I have pleasure in handing you herewith check for $13 50 for the Morse Testimonial, from the following persons.

Yours truly, D. H. Bates, Supt.

Cyrus L. Negley, foreman.	$2 00
Linemen.	
Charles Dean	1 00
Taylor Dixon	1 00
Penn Hooper	1 00
Isaac Roomer	1 00
Samuel Jacobs	1 00
M. F. Kline	$1 00
E. McGonagal	1 00
Henry Shay	1 00
H. H. Bortell	1 00
Richard Penn	1 00
John Dixon	1 50
	$13 50

A CITIZENS' SUBSCRIPTION.

ELMWOOD, ILLINOIS.

W. E. Phelps, Elmwood coal mines	$1 00
Alfred Castle, contractor, Wyoming	1 00
W. J. Phelps, banker, Elmwood	1 00
H. P Way, banker, Elmwood,	1 00
W. H. Kellogg, grain and stock dealer, Elmwood	$1 00
J. A. Putnam, Elmwood	1 00
J. M Leet, grain and stock dealer	1 00
F. G. Brown, manager, W. U. Tel., Elmwood	1 00
	$8 00

If this example of Mr. Brown's—offering the privilege to citizens to subscribe—were followed, the balance needed would be in hand January 1.

OMAHA, NEBRASKA.

Dear Sir: Here is our second list towards the Statue. Omaha desires it to be a success. We send it with great pleasure. Wish we could add a figure to it and make it $135.

Yours, Frank Lehmer.

F. Lehmer	$1 00
W. Lehmer, cashier	1 00
E. C. Morse, clerk	1 00
E. L. Armstrong, opr.	2 50
E. Lackner, opr	1 00
J. W Unwin, opr.	1 00
T. C. Stewart, opr	1 00
F. Drake, clerk	$1 00
Jno. D. Walker, opr.	2 00
A. B. Hibbler, opr	1 00
Messengers.	
Alonzo Guy	1 00
O. Bruce	00
John C. Smith	50
	$13 50

B. F. Brown, Salem, Oregon, runs 27 offices!	$2 00

L. S. Daniel, Galveston, Texas	$1 00
James E Price, Petitcodiac, N. B.	1 00
Mrs. Mary Allen, opr., West Point, Ala.	$1 00
B. F. Collins, Richmond, Texas	1 00

◆

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

The labor connected with each occurring death has now become so great as to be somewhat embarrassing. It is gladly performed, but New York days are short, and to accomplish the necessary work connected with the association the officers have to take the records to their homes. Some 30,000 entries have been made during the past year. The amount of publication done also is becoming excessive, and requires a change. In the present number all hitherto unacknowledged receipts for assessments except No. 17 are given. The design now is to acknowledge assessments by the number of the certificate instead of by the name. The acknowledgement of No. 17 we are compelled to postpone for want of time to prepare the matter for the press. By another number we hope to do so. Our friends must bear with us.

ASSESSMENT NO. 15.

P. Callahan,
A. Saville, 14, 15,
F. McMullen,
K. G. Worth,
C. W. Moore.
A. H. Graham, 14, 16,
F. T. Crossley,
Isaac A. Vandusen.

MISCELLANEOUS.

J. E. Ash, 13, 14,
G. J. Whitehead, 13,
G. S. Brooks, 14,
C. A. Smith, 14,
C. F. Sagolkin, 14.

ASSESSMENT NO, 16.

W. G. Jamieson, 15, 16,
J. H. Morgan, 14, 15, 16,
S. P. Peabody, 15, 16,
Miss C. A. Hinds,
Miss A. E. Gray,
Miss H Dieckman,
J. M. Nicholson, 14, 15, 16
F. Crouse,
M. W. Wilder,
F. C. Jackson,
H. R. Welch,
L. B. Carvers,
F. McMullen,
T. L Brown, 14, 15,
W. J. Evans,
Edwin F. Whedon,
A. W. Campbell, 14, 16,
H. R Mason, Jr.,
W. Riddle, Jr.,
Jno. C. Thomas, 15, 16,
Chas. T. Dorler,
C. L. Le Baron,
P. Degen,
C. M Clark,
T. M. Knox, 15, 16
H. H Ward, 15, 16,
J. L. Martin,
J. M. Bechtel,
G. M Dugan,
J. K. Moon,
J. Wenzel,
A. S. Farwell,
Sam'l Ward,
W. J. Ives,
R. B Lown,
D. Leary,
A. Pope,
H. C. Willson,
P. Schaffer,
C. O. Blake,
C. O Bots, 15, 16,
J. Hansen,
J. M. Outten,
R. N. Norton,
C. Moran,
G. K. Walcot, 15, 16,
C. O Morien,
H. M. Ogle,
T. W. Baugham,
W. J. Allen,
H. W. Wynkoop, 15 & 16.
M. C. Joseph,
A. E. Brown,
C. Beardsley, 15 & 16.
W. Cutvvis,
W. H. Brown,
E. J. Saville,
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Thomas Allen,
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J. F. Heenan, 15 & 16.
J. J. Heenan, 15 & 16.
J. R. Heenan, 15 & 16.
J. W. Smith, 15 & 16.
J. H. McEachern, 15 & 16.
M. Dean,
Miss Katie Howe,
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J. B. Stone,
W. G. Long, 15, 16,
L. Daniels,
M. D. O'Connor,
H. P. Thurber, 15, 16,
C. A. Thomas,
James A. McGee, 14, 15, 16,
W. M Clarke,
J. W. Duxbury,
J. F. Milliken,
G. M. Reynolds,
J. M. Whitely, 14, 15, 16,
John Fuller,
George J. Rae, 15, 16,
N. D Root,
John Tottrell,
J. E. Selden,
C. T. Sellers,
J. Babcock,
B. F. Ford,
R. H. Bishop,
W. Davis,
A. Davis,
C. D. Camp,
G. J. Whitehead,
D. McDonald,
Wm. Ferguson,
S. J. Smith, Jr., 14, 15, 16,
H. A. Tuttle,
E. P. Ely, 14, 15, 16,
A. H. Patterson,
W. Blanchard, 15, 16,
W. Roche, 15, 16,
M. Buell.
W. O. Woodson, 15, 16.

◆

A letter from Siemens Brothers, dated London, Nov. 24, says, in a galvanometrical test at their works, Woolwich, London, a locality extremely smoky, the Brooks insulators showed, during three days' rain, an average resistance of 27.670,000,000 Siemens' units. This is more than one thousand times the insulation of the standard English insulators.

◆

A meeting of the principal officers of the Telegraph Department will shortly be held in London, for the purpose of discussing and deciding the best means to be adopted for the further improvement and reorganization of the telegraph system. This meeting will represent all branches of the service. At this meeting the subject of securing correct and synchronous solar time by the aid of telegraph lines will be urged.

◆

THE RIVER.

Beautiful river,
With sunlight aquiver,
Rippling, and dimpling, and sparkling forever!
Where the cool forests meet,
Kissing the mountains' feet,
Thou, through the valley sweet,
Hast'ning with footsteps fleet,
Loitering never!

Musical river,
Rhythmical ever,
Pathetic, passionate, discordant never!
Ah! I remember well,
Better than tongue can tell,
How, like a fairy bell
Ringing its silvery knell,
Came thy soft, trem'lous tones floating forever!

Bountiful river—
Bless we thy Giver!—
Useful, and busy as beautiful ever!
Where the tall chimneys kneel,
Turning the giant wheel,
Whirling the rapid reel,
Floating the vessel's keel,
Indolent never!

Wonderful river,
Despairing never,
Thou dost teach man what he can to endeavor!
Yet at his weakness mock,
And, with mad, fleecy flock,
Down over walls of rock,
Plunging with thund'rous shock,
Exultant, all conqu'ring, rush on forever!

Icy-cold river,
Thou dost oft sever
Hearts of affection to meet again never!
Children and mother,
Sister and brother,
Many a loved one from arms of her over;
Thou, in a stately march,
Under the bridge's arch,
Sweeping majestic, and holding thy breath,
As mortals, in
Silence, sweep under the archway of Death!

Mystical river,
With moonbeams aquiver,
Or, darkling with shadows, still flowing ever!
So on Life's billow
Shine we or shiver,
Sparkling with gladness, or under grief's willow
Dashed over rocks, or with moss for our pillow—
Still onward flowing,
Unknown, unknowing
Whitherward going,
Save to the Giver,
Omniscient of life and the beautiful river!

[*Appleton's Journal.*

◆

DIED.

Kughler.—In Greenville, November 15, 1870, Artie, only son of J. C. and Mrs. Nellie Kughler, aged 6 years, 3 months and 4 days.

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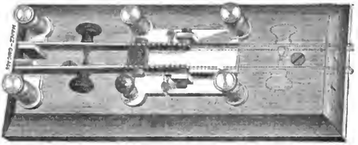

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BATH, N. Y., Dec. 1, 1870.

To the Editor of the Journal of the Telegraph.

DEAR SIR: Please find inclosed notice of the death of Mr. Robert Underhill of this place. Mr. U. was a young man of much promise, and a first class operator of several years' standing, having had charge of several important telegraph offices.

Please inform our fraternity through the JOURNAL, and oblige,

M. A. QUICK, Operator.

ROBERT UNDERHILL, second and youngest son of R. L. Underhill, Esq., of this village, died on Friday night last of consumption. He retired at his accustomed hour on Friday evening, feeling better than he had for many days. During Friday he had been out riding and walking about the village. He was found dead on Saturday morning in his bed, having died during the night without the appearance of the least struggle. His age was 29 years. His death was not unexpected, on account of the nature of his disease, and yet "Doc," as he was familiarly known among his friends, will be greatly missed. He was genial, generous, well known, and highly respected.—*Courier.*

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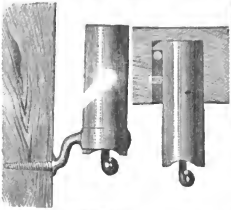

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JOURNAL OF THE TELEGRAPH.

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A DISAPPOINTMENT.

In our desire to render the erection of the Statue in honor of Prof. Morse national, we invited the President to unveil it. It is therefore with no little regret we have received the following courteous reply from the Secretary of State, stating the President's inability to accept the invitation:

DEPARTMENT OF STATE, WASHINGTON, Dec. 20, 1870.

JAMES D. REID, *Esq., Chairman, &c.*

SIR: I have presented to the President your letter of the 19th inst., requesting him to unveil the Statue which it is proposed to erect in the Central Park, in New York, in honor of Professor S. F. B. Morse, on the eightieth anniversary of his birthday, on the 27th of April next.

The President appreciates the propriety of the tribute which is proposed to an eminent citizen whose genius has brought the most subtle and rapid agent of nature to be the most docile and tractable servant to the social and business intercourse of man. He feels that all honor is due Professor Morse.

But the time proposed for unveiling the Statue precludes his attendance. Engagements already made require his presence elsewhere at that time should Congress then have adjourned. Should Congress continue in session until the last of April, it will then probably be so near its adjournment that he could not be absent from the Capital.

He desires me therefore to express the regret with which he is constrained to decline the invitation you have requested me to lay before him. I have the honor to be,

Your obedient servant,

HAMILTON FISH.

◆

ON THE MAXIMUM OF MAGNETIC POWER EVOLVED BY A GALVANIC BATTERY.

To the Editor of the London Chemical News.

SIR: I gladly avail myself of the opportunity afforded me to enter more fully and deeply into the question raised by me in my paper read before the British Association.

Let me first, then, define, in this connection, the amount of magnetic force or power to be "the number of units of weight which the magnet will raise through a unit of height." In the case of a magnet, the unit of height taken should be small, because the power varies considerably (generally inversely as the square) at different distances. I might define magnetic force to be the amount of weight which a magnet will sustain, which is in proportion to the weight raised through a unit of height, but it might be objected that this is only a static, not a dynamic, force. It might be defined in many other ways, but I think this will answer the purpose, and be as simple as any. It might be measured by the method of torsion, or the number of oscillations caused in a second in a magnetic needle. While I am giving definitions, let me say that by "a given battery" I do not mean "one capable of distributing a definite quantity of force," for that involves the very question at issue; but I mean a battery of a given number of cells, with elements of a given size and of a given material, at a given distance from each other in a given electrolyte; and by the maximum of magnetic power evolved by it, I mean the maximum power evolved by a given consumption of zinc or other positive element. It has always been assumed, as a kind of axiom, that a given battery, by a given consumption of zinc (or a given amount of chemical change), can only produce a certain maximum of force. Now the question I wished to raise was whether this was true; whether facts, and the ordinary accepted laws based on facts, did not show that a given amount of chemical change could, by skill, be made to produce any amount of force whatever. I do not care to defend the suitability of the terms or manner in which I expressed myself in the abstract of my paper read at the last meeting of the British Association; but what I do wish is to raise this grand question.

I am quite aware that, at present, the majority of the scientific world would at once decide in the negative *à priori*—and perhaps refuse even to discuss it. But it is a question, not of preconceived theory, but of fact. When Galileo dropped weights of one pound and ten pounds from the tower of Pisa, and the sound of their collision with the ground rung on the ear simultaneously, the scientific men of the day refused to believe their senses, because Aristotle had shown that a ten-pound weight must fall ten times as fast as a one-pound weight. But facts have since proved too strong for theory. I freely confess that I was indistinct and obscure in my mode of expressing myself in the paper above mentioned, and therefore let me now state distinctly that what I wish to assert, as at present advised, is that a given amount of chemical change can be made (I do not say economically or conveniently, but *can* be made) to produce an unlimited amount of force. I wished in the reasoning and experiment given in that paper to show that whatever amount of force a battery was producing, that amount might be doubled or, in fact, increased indefinitely.

To simplify the matter, let me take the simplest possible case. Take a battery with an exterior circuit consisting of one electro-magnet, which shall be capable of sustaining n pounds when the circuit is closed. Then I assert that if for the one electro-magnet n electro-magnets be substituted, and the current passed in succession through them, each electro-magnet will sustain one pound, and also that if in the first case the battery were consuming n grains (or other units) of zinc per second, it will now only consume one grain, so that the consumption of one grain of zinc will now produce as much force as n grains did before. I may say, indeed, that, as a matter of fact, each magnet in the second case will sustain rather more than one pound, for, on account of reasons which it is not worth while here to enter into, the magnetic force will decrease rather less than in proportion to the intensity.

But, to probe the matter to the bottom, we must divide the time during which the battery acts into three periods, and describe what takes place during each: 1. The time which it takes the electric force to traverse the circuit after it is closed. This in ordinary cases is infinitesimal; but where the circuit is very long, and where there is much inductive as well as conductive resistance, as in the Atlantic Telegraph, the time becomes very appreciable. But I would remark that the expenditure of zinc during this first period is occupied in producing a state of tension in the conductor which, theoretically speaking, forms a store of available force that may afterwards be recovered. 2. There is the period during which the magnet is pulling its keeper to itself, and is positively doing actual work. Now, paradoxical as it may seem, it is a fact that during this period (No. 2), while the magnet is doing actual work, the intensity and the consumption of zinc is actually diminished, so that, in one sense, the more work done the less the fuel (so to speak) which is consumed in doing it. It is in this point that a galvanic battery differs from other machines which do work. It is as if a horse, when he did work, ate actually less food than when he was idle, and wasted less muscle, or as if a locomotive consumed less fuel when in motion than when at rest. 3. Then comes the third period, when the keeper has been pulled home, and the weight is merely sustained. During this period no actual work is being done, and the weight sustained only shows what work the magnet is capable of doing, and so serves as a measure of its potentiality, and during this period (No. 3), strange to say, more zinc is consumed per unit of time than while the work is being done. In practice, therefore, in an electro-dynamic engine, period 3 should be reduced to *nil.*

Now break the circuit. If there be a secondary wire (as in a Ruhmkorff coil), the tension produced during the first period may be utilized in some way by the counter-current produced in thus breaking the circuit, and the same series of phenomena may then begin over again.

What I contend, then, is briefly this (and I will put the matter as distinctly as I can)—that though by lengthening the circuit we prolong the time (period No. 1) which elapses before the magnetic force begins to act, we nevertheless, out of the same consumption of zinc, get an indefinite increase of the force produced. And here let me add that if an electro-dynamic engine were made to act by producing continuous rotation without alternately breaking and closing the circuit, period No. 1 would only come once during the time the engine was at work.

This conclusion of mine may appear paradoxical, but I believe it to be true, both because well-known laws lead logically to it, and because I have found the fact confirmed by experiment. There is one analogous case perhaps still simpler. Take a battery, insert in the circuit a voltameter with silver electrodes, and containing solution of nitrate of silver. Now separate the electrodes to a distance from each other n times as great as before. This will simultaneously diminish the intensity and the consumption of zinc, but the result will be that the consumption of one equivalent of zinc will convey an equivalent of silver over n times the distance it did before; or if the size of the plates of the battery and of the electrodes be increased severally n times, so as to make the intensity the same as the first, one equivalent of zinc will convey one equivalent of silver times the distance it did before, and in the same time.

One word more: If the magnetic power of a battery is not illimitable, what is its limit? Let some one give me a reply. The only reply I can find is a statement that the greatest amount of energy is produced in the exterior part of a battery circuit when the exterior and interior resistances are equal. Now, in the first place, this can only be true in any case when we do not take into account the amount of zinc consumed, and in the second place it is only true of the *heat* produced, and it is assumed that all other kinds of energy are in proportion to the heat, than which I venture to say no greater error has ever obtained so wide a credence, in an age of critical science. If it were true, all our galvanometers should be formed with short lengths of as thin wire as possible, and our electro-magnets and helices should also be made with very thin and very short wires, which every one knows in practice would be absurd. I am, &c.,

H. Highton.

Putney, Nov. 22d, 1870.

P. S.—In a paper read to the British Association, I maintained that the negative force to be derived from a grain of zinc was without limit.

I gave experiments which proved this, for I showed how a definite force could be got from an indefinitely diminishing consumption of zinc, or an indefinite increase of power from the same consumption.

In fact, my experiments, when I tried them, proved more than this; for, having first found that a battery working a magnet sustained 8 lbs., I made it support 9 lbs. with half the consumption of zinc. I also found an equal consumption of zinc supported 18 lbs. by mere alteration of arrangements. As other people may repeat the experiments and find them fail, I may say that I have since found that the particular alterations of arrangements here described, though answering in that particular case, will by no means answer in all cases. The laws of magnetic power vary so very much in different condition of sizes of wire, dimensions of iron core, and battery strength—conditions which can only be learnt by an immense variety of experiments, that it requires a very special and particular knowledge and experience to apply the particular expedients required under varying conditions.

Nevertheless, in all cases the difficulties may be got over by skill, and the truth, theoretical and practical, remains the same, that the magnetic power of a battery may be increased without limit.

The magnetic power of a circuit is always measured (according to varying conditions) by some power or other of $l \times i$, l being the length of wire outside the battery, and i the intensity of the circuit, and as $l \times i$ may be increased without limit, the magnetic power may be increased without limit. How to vary l and i to the greatest advantage under varying circumstances is the problem which exercises the skill of the engineer. This I may safely say, that never yet has an electro-moter been constructed with a real knowledge of the scientific problem to be solved. I propose shortly to discuss Jacobi's paper on the subject, written in 1850, which still remains the great authority, but which is full of errors. H. H.

◆

Electric Action on Glass.—If two metallic conductors be placed with their points exactly opposite to a glass plate, which turns easily in a plane on an axis, and positive electricity be passed through one and negative electricity through the other, the plate begins to rotate.

BATTERY POWER.

The communication of Mr. Morris, of Nashville, on battery power, which we published in our last issue, requires some correction. In reproducing Mr. Prescott's statement that the Grove cell is the maximum amount of power required for working through 120 ohms circuit resistance, Mr. M. proposes to show that in his locality less than forty per cent of this amount is used, but his mode of arriving at circuit resistance by adding together all the wires which run out of a battery is not a correct one. When we speak of circuit resistance, we mean the resistance of a particular circuit—that is to say, the resistance which is included between the termini of a single line. For example, the length of the line between Nashville and Cairo is 297 miles, and it has 17 relays. Estimating the resistance of the wire at 20 ohms per mile, and the relays at 200 ohms each, the circuit resistance is 9,340 ohms. This circuit is worked by two batteries, having an aggregate of 91 cells, which gives one cell to each 108 ohms resistance. The Nashville and Memphis circuits have resistances of 7,420 and 8,020 ohms, and are worked with 86 cups of battery, which is one cell for each 86 and 93 ohms respectively. The Nashville and Atlanta circuit has a resistance of 8,860 ohms, and is worked with 86 cells of battery, which is one cell for each 103 ohms resistance. The Nashville and Chattanooga circuit has a resistance of 6,420 ohms, and is worked from 86 cups of battery, which is one cell to each 75 ohms resistance. The Nashville and Henderson circuit has a resistance of 5,600 ohms, and is worked with 50 cells of battery, which is one to each 112 ohms circuit resistance. The two Louisville circuits have respectively resistances of 6,700 and 8,700 ohms, and are worked with 78 cells of battery, which is one cell to each 85 and 112 ohms resistance. The above are all estimated resistances, and the actual resistances may be considerably more in some cases and less in others.

◆

THE ALBION WIRE WORKS, SHEFFIELD.

"The opening of a new wire and steel works, by the well known firm of Gray & Co., of the Albion Works, Sheffield, brought together a large number of the leading gentlemen connected with the steel and iron trades, America being also represented on the occasion. In addition to the new wire mills, which are not excelled by any in the kingdom, there was the still greater attraction of being able to see at work the new patent system for generating gas to be used in the heating furnaces. The great increase which has arisen during the last few years in the demand for iron and steel wire is very noticeable. Formerly the trade was in a great measure confined to the finer qualities for needle-making, hooks, and iron wire for bonnets and mechanical purposes, the quantity consumed being infinitesimal as compared with late years, and the business in the hands of a few houses. The introduction of the telegraph system, land and sub-marine, wire ropes and rigging, and various other articles now made of iron and steel, which were not formerly made of those materials, have led to such a demand for wire that it has become an important branch of our national industry. The vast network of wires which now encircles the globe, and brings the most distant countries within an hour or two of each other, are but an instalment of what time will develop, so that the production of telegraph wire has yet to see its prime. Most countries of importance will desire to have a system of their own, and 'put a girdle round the earth,' or a large portion of it at least, so as to have it at their own command. The apparatus for generating the gas is in itself simple, and consists of two fire-brick chambers, connected at the bottom by a short flue. The first chamber contains the fuel in a powdered state, such as small coal, coal-dust, sawdust or peat, and is fed from time to time at the top. The fuel descends by gravity, and is burnt by the aid of a fan blast entering through a number of tuyeres near the bottom of the chamber. The gaseous products of this combustion pass through the flue into the second chamber, which is supplied from time to time by a door placed at or near the top with coke or large pieces of non-bituminous coal, so that all the gases resulting from the combustion in the first chamber are forced to ascend through a column of red-hot coke. The gas is thus converted into carbonic oxide, and is then ready for use, and the carbonic oxide gas thus produced may be burnt by either hot or cold blast, as the process to be carried out requires a higher or lower degree of heat."—*English Paper.*

A lengthy description of a banquet at the opening of the works referred to above accompanies the article from which we quote. The works themselves seem to be of extraordinary capacity, and all the appliances to be of the most superior kind. Works of this character and extent reveal the progress of the telegraph more emphatically than any statistics.

Messrs. Gray & Co. have had an agent in New York for some time past, Mr. Wm. Milner, with whom we have occasionally met, and who, after a holiday visit to his home, proposes to return to it in the spring. If the principals are as assiduous and as polite as their American representative, they deserve all the success they seem to have attained. The consumption of wire throughout the world is indeed marvelous, and there seems no symptoms of any abatement in the demand for it. So we bid Messrs. Gray and Mr. Milner God speed.

◆

RIGHTS OF CIRCUIT.

To the Editor of the Journal of the Telegraph.

In behalf of those in a position to appreciate it, I wish to make a few remarks in regard to right of circuit for testing wires.

I have heard many claim that breaking into a message for "wire" is unreasonable and unpleasant. In the first place, he whose duty it is to test and keep up the wires, may have but a few moments to make a test, or delay the repairer one train if not made quickly. But laying all such reasons aside, I claim it is much the better plan to break into a message than to wait until the end of one; for it is so much easier for the parties who were using the circuit to get started again in the middle of the message, because no one will wrangle for the circuit if the signal "4" is made; and it often happens that if the sender and receiver insist upon finishing the message, some one will make a grab for the circuit, hearing "O K," &c., and being under the impression that his right is as good as any one's, he makes a pretty good fight, and finally gets possession only to see how much he has obstructed the Company's business.

For my part, break me in the "middle" of the message (every part of the message is "right in the middle of it"), and accept my thanks, in my own as well as in behalf of the Company. I will guarantee that in a hundred trials of the experiment, it will occupy twice as much time to get the circuit for "wire" at the end of a message as in the middle of it. Yours truly, X. Y. Z.

◆

Bound copies of Volume III. of The Journal of the Telegraph may now be had. Price, $2 50.

THE WIRES AND THE SPARROWS.

Little birds sit on the telegraph wires,
And chitter and flitter, and fold their wings:
Maybe they think that for them and their sires
Stretched always on purpose these wonderful strings;
And perhaps the thought that the world inspires
Did plan for the birds among other things.

Little birds sit on the slender lines,
And the news of the world runs under their feet,—
How value rises, and how declines;
How Kings with their armies in battle meet;
And all the while, 'mid the soundless signs,
They chirp their small gossipings, foolish-sweet.

Little things light on the lines of our lives,
Hopes and joys and acts of to-day;
And we think that for these the Lord contrives,
Nor catch what the hidden lightnings say.
But from end to end his meaning arrives,
And his word runs underneath all the way.

Is life only wires and lightnings then,
Apart from that which about it clings?
Are the works and the hopes and the prayers of men
Only sparrows that light on God's telegraph strings,
Holding a moment and gone again!
Nay; he planned with the birds for the larger things.

—*Old and New.*

◆

Telegraphs in the Argentine Republic.—A correspondent from Buenos Ayres writes the *Eclectic Review*, on October 4th, of the satisfactory progress made in extending telegraph communication throughout the Argentine Republic, upon which he has been for upwards of two years engaged in organizing and managing the first government telegraph from Buenos Ayres to Rosario, as also the present organization of the national lines for all the Republic. He mentions that a second line between Buenos Ayres and a point on the present line, 40 miles short of Rosario, have been contracted for by the National Government, a distance of about 150 miles; the present line is about 210 miles, takes a very circuitous route, and belongs to the Provincial Government of Buenos Ayres. When this new line is completed, the National Government system will place the capital in direct communication with the whole of their system. From Rosario to Parana, 130 miles, is also completed. From Parana, the national line branches north to Paraguay, a distance of 500 miles, and thence eastward to Brazil, 500 miles; the works of which proceed but slowly in consequence of the insurrection in Entre-Rio, notwithstanding which the contractor still goes on. From Rosario the contractor for the National Government is erecting one of their lines to Cordova, a length of 246 miles.

◆

Experiments to Test the Resistance Opposed to the Passage of Electricity by Powdered Conducting Matter.—Two crucibles were filled with blacklead powder (the best commercial blacklead used for domestic purposes). Two crucibles were filled with powdered charcoal obtained from a charcoal dealer. The battery poles of a 12-cell sulphate battery were placed half an inch apart in the powders, a horizontal galvanometer being included in the circuit, and no deflection was obtained either with the blacklead or the charcoal powder; the galvanometer employed gave a deflection of 50 deg. with 12 cells through a resistance of 65,000 ohms. The crucibles were then heated to a full red heat, and the poles of the 12-cell battery placed in the heated powder, and the resistance opposed by the heated powder in each crucible measured. The wood charcoal gave a resistance never exceeding 7 ohms. The blacklead gave a resistance never exceeding 6 ohms. The crucibles were then removed from the fire and allowed to cool, and tested again some days afterwards; the powders were now found to conduct when cold. The wood charcoal powder gave a resistance continually varying and ranging between 2000 and 500 ohms. The blacklead gave a more constant resistance, ranging between 400 and 100 ohms.

The effect of highly heating charcoal and blacklead appears to be to make the particles more dense, and to bring them closer together, so that they conduct, and therefore, in the construction of the "bridge," it is necessary to mix sufficient non-conducting powder with the carbon to prevent the carbon particles from actually touching one another; these particles of non-conducting matter act in a somewhat analogous way, as the particles of non-combustible matter in Gale's gunpowder—they insulate particle from particle.

◆

Members of the Telegraphers' Insurance Association will please be careful to indorse their remittances. The Treasurer has several dollars from parties who have simply enclosed their remittances in the circular sent them, with no indication from whence or from whom they came.

◆

South West, Pa., Dec. 14th, 1870.

To the Editor of the Journal of the Telegraph.

have read in the Journal notice of the Double Spring. Wherefore, a few days ago, I took a piece of rubber cord, and having an extra adjusting screw in my office, I inserted it at the right hand of my relay, opposite the regular adjusting screw, and connected the rubber cord to it. I then adjusted the left hand quite strong, then tightened the other until I had circuit; the result was that I could hear every office call on the line, which is about two hundred miles in length, with thirty-four offices, without touching my instrument to adjust, not even when I write myself; I can write also with less labor. I think if every operator would try the plan, he would find it to his advantage.

Carr.

◆

Haverstraw, N. Y., Dec. 7th, 1870.

To the Editor of the Journal of the Telegraph.

Dear Sir:—Please allow me through the columns of your Journal to give a little evidence in favor of Mr. Gough's Double Spring. I have worked H. office for three years or more, and during that time have had very hard work to keep properly adjusted; in fact, could not keep adjusted for New York and Albany, at the same time hear my own writing. The line on which H. office is located is from Albany to New York. There are eighteen or twenty offices on the wire, and I found great trouble in adjusting, until I saw the letter of Mr. Gough in regard to his double spring to be attached to the relay. I immediately gave it a trial, and was highly pleased with the result. Thanks to Mr. Gough, I can now keep adjusted for all offices, and hear my own writing without fears of breaking. By publishing the above you will greatly oblige,

Yours truly,

Isaac M. Purdy.

◆

The challenge of Utica, Pa., has brought to us a perfect avalanche of letters, many of them very amusing. Here is one before us from Pollygonhook, Miss., stating how many offices the manager does *not* hold. For example: "I am not a frog propagator. I do not vend second-hand clothes. I do not use Drake's Plantation Bitters, nor part my hair in the center; never wind my watch with a boot-jack," &c. This came from one of our old boys, as many others have. But we must enjoy them in private to prevent giving offense by selecting. The enumeration of some offices is marvelous. If they do only one thing at a time, we do not see how they ever get time to do them all.

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

DEATH OF GEORGE M. HARRISON.

We give below the announcement of the eighteenth death since our organization. The circumstances appeal strongly to all to see that the assessment, which goes to the widowed mother, is promptly and fully paid up:

Albany, N. Y., December 22, 1870.

George M. Harrison, assistant bookkeeper in this office, died this A. M., after an illness of two weeks caused by a ruptured blood vessel. By his mild disposition and exemplary character he had endeared himself to us all. For nearly two years an employee of this Company, always at his post, and cheerfully performing all duties imposed upon him, we feel that the Company has lost a faithful servant, and we a friend and brother. Throughout his entire sickness he placed himself in the hands of Him who doeth all things well, and was ready to receive the message which released him from all suffering. He was the only support of his widowed mother, and it will be a satisfaction to the members of the Association to know that by payment of their assessment relief in a most pressing necessity comes to one whose support has thus suddenly been removed.

E. S. Keep.

◆

Ocean Telegraph Legislation.—Mr. Willliams, of Oregon, made an ineffectual effort to get up his resolution for a joint committee to take charge of all the ocean telegraph legislation. Messrs. Conkling, of New York, and Sumner, of Massachusetts, objected to the latter upon the ground that the pending legislation of the character referred to, would have to lose its position on the calendar, to be referred to the committee if appointed. They suggested that the existence of the committee should date from the beginning of the next session. Mr. Williams spoke of the necessity of his resolution as a rule for the guidance of the legislation, amid the many conflicting propositions which had been made. In one case twenty propositions were now pending in regard to a single line. Some of the subsidies applied for bonds and others for lands. By a joint committee all interests and sections could be heard. He gave notice he would to-morrow renew his effort to take up a resolution.

PERSONAL.

B. H. Rothwell, formerly at Corunna, Mich., transferred to Fenton, Mich.

Fred. Betts, formerly night operator, Holley, Mich., now day operator at Corunna, Mich.

T. S. Parsons, formerly at Ferrysburg, Mich., transferred to Lowell, Mich.

W. R. Thomson, of Davisburgh, Mich., has resigned, and Mr. J. Belcher has been appointed in his place.

BORN

HORNE.—In Brooklyn, N. Y., Dec. 10, to John Horne, Jr., Manager W. U. Tel., Stock Exchange, N. Y., a daughter

MARRIED.

CLUTE—SHELLENBERGER.—On the 15th inst., at the First Lutheran Church, Harrisburg, Pa., by the Rev. J. F. Stelling, Mr. Horace A. Clute, of the W. U. Telegraph Co., formerly of Syracuse, N. Y., to Miss Mary Shellenberger, of Harrisburg.
No cards.

McCLUER—PARRY.—On the 13th inst., at the residence of the bride's father, by Rev. D. W. Shanks, Mr. Chas. E. McCluer, Manager W. U. Telegraph Office, Lynchburg, Va., and Miss Lottie E. Parry, of Rockbridge Co., Va.
No cards.

PEABODY—MUNN.—On Thursday, Dec. 15th, at the residence of the bride's brother, Capt. B. M. Munn, Chicago, Sargent P. Peabody to Miss Hattie W. Munn.

STEWART—BRAZELTON.—Nov. 16, 1870, at the residence of the bride's father, by the Rev. W. B. Watterson, Mr. J. M. Stewart, of the Cowan, Tenn., Office, to Miss Lizzie H. Brazelton, of Franklin county, Tenn.

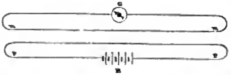
TOLFER—BROWN.—At the residence of the bride's father, noon, Dec. 7th, Mr. J. Herbert Tolfer, Agent Flint and Pere Marquette R. R., and Operator W. U. Telegraph Co., Mt. Morris, Mich., to Miss Hattie T. Brown, of Buffalo, N. Y.

ANSWERS TO CORRESPONDENTS.

As you omitted to communicate the facts upon which you based your conclusions in regard to the cause of the trouble on your wires, or to state fully all the tests by which you demonstrated that the difficulty was due to current induction, we are not as well prepared to discuss the probable correctness of your views as we should be were we in possession of more complete data. Your proposed remedy for the trouble, however, supposing it was caused by current induction, would only increase, instead of diminish, the difficulty, for you cannot make artificial crosses between wires, no matter how much resistance they contain, without causing a mixture of the currents, and cause thereby more or less interference with the signals. The proposition to decrease the batteries is a good one, provided there is now an excess of power on the wires; but the suggestion to increase the sensitiveness of the relays, by adding more turns of fine wire to the helices, for the purpose of obviating the effect of the so-called induction, does not meet with our approval, since you augment the effect of extraneous influences upon your magnets, just in proportion as you increase their sensitiveness.

Before we seek for a remedy, however, we should first satisfy ourselves as to the nature of the disease. Let us, therefore, carefully examine the facts presented. You think you have demonstrated that the present trouble is due solely to current induction that is to say, to an inductive influence produced by one electric circuit upon another; but you also state that the writing sent upon one wire can be read upon the other, which is inconsistent with the inductive theory; for an inductive current is a momentary or vanishing current, and does not furnish signals of sufficient length to produce writing by the Morse alphabet.

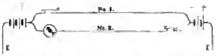
The following diagram will serve to illustrate the law of current induction:



Two parallel circuits are shown, the extremities of the one, p p, being in connection with the poles of a battery, B, and those of the other, m m, with a galvanometer, G. The instant that the circuit is closed containing the battery, and a current is sent along the wire, p p, a current in the opposite direction is induced in the wire, m m, which is shown by the deflection of the needle of the galvanometer. This induced current is only momentary, for though the current continues to circulate in p p, the needle soon falls back to its original position of rest, and the wire m m gives free passage to other currents, and appears to be in no way affected. If, now, when the needle is at rest, the battery circuit be broken and the current in p p stopped, another momentary current is indicated by the galvanometer needle, but in this case in the same direction as the inducing current.

Upon a telegraph line, when the wire at a distant station is open, and a key connecting with one pole of a battery, the other pole of which is to earth, is closed so as to put the battery in connection with the line, at the instant when the connection is made, a current flows into the wire, and if the insulation of the line is perfect, almost instantly ceases. The needle of the galvanometer makes a sudden deflection, and then returns to its position of rest. If, now, the battery connection be cut off, and the line put to earth, the needle deflects momentarily in the opposite way, and the charge given to the wire returns and goes to the earth. This flowing back again of the charge is called the return current. The return current shows that a telegraphic line may be charged statically, like a condenser. A line of telegraph may be looked upon as a Leyden jar, the wire as the inner coating, the air as the glass or dielectric, and the earth as the outer coating. The return current is most marked in long lines. The statical charge of which a line of telegraph is thus capable, shows that the electric force not only tends to propagate itself longitudinally, but laterally. The effects of lateral induction on the transmission of telegraphic currents constitute what is termed inductive embarrassment, and simply retards the speed of transmission, this retardation increasing with the square of the length of the line. Upon a telegraph wire of five hundred miles or less in length, composed of No. 9 iron wire, this retardation would not interfere with the speed of ordinary transmission by the Morse system; but upon a similar wire of one thousand miles in length, it would not be practicable to transmit at a rate of speed exceeding fifteen words per minute.

The test shown by the following diagram, by which you supposed you had demonstrated that the trouble on your lines was due to induction, does not indicate that it was caused by current induction, nor that the effect produced upon your galvanometer was due to the same influence which caused the difficulty in working the wires.



When the key on No. 1 was closed, the needle of the galvanometer was deflected and then returned to zero; and, when the key was opened, the needle was again deflected, but in the opposite direction, and then returned to zero.

Now, some of the symptoms in the above case are similar to those shown in the diagram representing current induction, but the conditions under which they are brought about are very dissimilar. In the one case the circuit which contains the galvanometer is closed, and in the other it is open; in the one case the deflection is caused by current induction, and in the other by lateral induction or a static charge and discharge. In the case shown by you, the deflection of the needle was caused by charging and discharging the wire which was insulated or open at the further end. When the key on No. 1 was open, the insulated wire, No. 2, contained a charge equal to the potential of the battery connected with it, but, when the key was closed, the insulated wire was partially discharged by the reduction of the potential of the battery, and the needle of the galvanometer was deflected. Upon opening the key on No. 1, the insulated wire, No. 2, was again charged, and the galvanometer needle deflected in the opposite direction. This static charge can be found to exist upon all telegraph lines which are well insulated, whether long or short, but to a far greater extent upon very long lines. It has nothing, however, to do with the interference between wires attached to the same poles. The mixture of currents which produces such interference is generally due to escape from one wire into the other, through moisture on the supports, or in consequence of imperfect ground connections. The trouble which you experience is unquestionably due to conduction between the wires, and, very probably, to an imperfect ground, since your wires are thoroughly insulated.

THE MORSE STATUE.

The clay model is at last complete, and such is its evident excellence, and such the impression it has made on the minds of those who have seen it, that we have become convinced of our duty to accept it at the artist's hands. The following are some of the testimonials left at the artist's room:

FROM GEN BANKS.

It is a magnificent Statue, and a fine portraiture.

N. P. Banks.

FROM DR. GREEN, VICE-PRES'T W. UNION TEL. CO.

I consider the clay model of the Statue of Professor Morse, a most excellent likeness, and, as far as I am able to judge, the whole design a magnificent work of art.

Norvin Green.

FROM HENRY J. ROGERS.

The Pickett Statue of Prof. Morse is a striking likeness, and a magnificent work of art.

H. J. Rogers.

FROM PROFESSOR MORSE.

5 West Twenty-second-St., Dec. 30, 1870.

My Dear Sir: In reply to your request for my opinion of the Statue, which under the flattering promptings, principally of the large corps of operators of the Telegraph, not only in the United States, but in Canada, Mr. Pickett was chosen to model, I have only to say that *as a work of Art* I consider it eminently successful, and in the highest degree creditable to the genius of the sculptor.

In regard to its faithfulness as a likeness, others must be the judge. Generally the most fastidious critics in this respect, as artists well know, are the family of the sitter. In this case every member of my family who have had an opportunity of seeing the statue pronounce it a faithful likeness.

With respect and esteem,
Your friend and servant,
J. D. Reid, *Esq.* Sam'l F. B. Morse.

As relatives are proverbially the hardest to satisfy in any work of this kind, we value the following:

FROM THE FAMILY OF MR. MORSE.

We, whose names are hereunto signed, of the family and relations of Prof. Samuel F. B. Morse, having seen and examined the statue which has been modelled by the sculptor, Byron M. Pickett, and as it stands in clay, preparatory to its being cast in bronze, take great pleasure in expressing our entire satisfaction with Mr. Pickett's labors, especially with the faithfulness and truthfulness of the likeness to the original.

Cath. W. Griswold, mother-in-law of Prof. Morse.
Sarah E. Morse, Wife.
E. L. Morse, Son.
Sidney E. Morse, Brother.
Mrs. Richard Morse, Sister-in-law of Prof. Morse.
Chas. W. Morse, Son.
Mary Seymour Walker, Cous.
Leila L. Morse, Daughter.
William G. Morse, Son of Prof. Morse.

* * *

MORSE TESTIMONIAL FUND.

RECEIVED SINCE LAST ISSUE.

General J. K. Moorhead, Pittsburgh, Pa.	$20 00
John Horner, cashier, New York	20 00

HERE IS A GENEROUS LIST.

Mansfield, O., Dec. 23d, 1870.

J. D. Reid, *Esq.*

Subjoined find one hundred and fifty-four names, and enclosed a draft for one hundred and eighty-six dollars, the amount covering the *second subscription* of the Telegraph fraternity on the P. F. W. & C. R. and branches, towards the Morse Statue. In the branches are included the Erie & Pittsburgh and the Indiana & Grand Rapids lines, which are managed by the officers of the P. F. W. & C. R'y Co. If the powers that be shall hereafter determine to make the Statue of silver or gold, we are ready and willing to honor a third call. I am indebted to the activity and well-directed energy of H. W. Wynkoop, Esq., Manager of Crestline (Ohio) Office, for the very fair proportions of this second subscription.

Yours,
O. H. BOOTH,
Sup't Telegraph.

J. D. Layng, supt. P. F. W. & C. R. R., Pittsburgh, Pa.	$10 00
J. D. Ellison, dispatcher, Pittsburgh, Pa.	5 00
D. B. McCoy, dispatcher, Pittsburgh, Pa.	3 00
A. T. Lee, operator, Pittsburgh, Pa.	2 00

W. E. Beal, operator, Pittsburgh, Pa	2 00
H. O. Hukill, operator, Pittsburgh, Pa	2 00
Chauncey F. McCoy, ex-operator, Pittsburgh, Pa	2 00
Miss Lizzie Davy, operator, Sewickley, Pa	1 00
C. Masten, ex-operator, Rochester, Pa	1 00
A. M. Mosier, operator, Rochester, Pa	1 00
P. M. Boure, operator, Rochester, Pa	1 00
A. C. Silver, repairer, Rochester, Pa	1 00
Will Masten, clerk, Rochester, Pa	50
C. H. Reid, clerk, Rochester, Pa	50
Geo. L. Lang, operator, New Brighton, Pa	1 00
John J. Deem, operator, New Brighton, Pa	1 00
L. G. Townsend, operator, Beaver Falls, Pa	1 00
O. L. Perry, operator, Highland, Pa	1 00
R. E. Disbrow, operator, Highland, Pa	1 00
C. Covert, student, Highland, Pa	1 00
D. A. Robertson, ex-operator, Enon Valley, Pa	1 00
J. P. Kennedy, operator, Enon Valley, Pa	1 00
Miss Maria Robertson, operator, Enon Valley, Pa	1 00
T. M. Bates, dispatcher, Erie, Pa	2 00
Ed. Purcell, operator, Erie, Pa	1 00
Ed. Cowell, operator, Erie, Pa	1 00
C. C. Bone, operator, Erie, Pa	1 00
Frank Brubaker, messenger, Erie, Pa	25
E. H. Scott, operator, Girard, Pa	1 00
Henry S. Miller, operator, Girard, Pa	1 00
A. C. Dutcher, operator, Albion, Pa	1 00
S. W. Vincent, operator, Conneautville, Pa	1 00
J. K. Raleigh, operator, Linesville, Pa	1 00
J. W. Piffers, operator, Transfer, Pa	1 00
DeWitt Titus, operator, Sharpsville, Pa	1 00
J. J. Reno, operator, Sharon, Pa	1 00
R. R. Wise, operator, Wheatland, Pa	1 00
D. T. Brown, operator, Middlesex, Pa	1 00
G. H. Cormick, operator, Spring, Pa	1 00
A. M. Coulter, operator, New Castle, Pa	1 00
Horace Miller, messenger, New Castle, Pa	25
Jas. A. McNair, messenger, New Castle, Pa	75
C. H. Beatty, ex-agent, Greenville, Pa	50
J. C. Kuchler, agent, Greenville, Pa	50
R. R. Kelsey, operator, Greenville, Pa	50
Jno. McAdoo, citizen, Greenville, Pa	50
Duane Buck, citizen, Greenville, Pa	50
H. J. Garvey, operator, Jamestown, Pa	1 00
E. S. Welch, operator, Pulaski, Pa	2 00
A. B. Bennett, operator, Espyville, Pa	1 00
C. C. McConnell, operator, Lowell, Pa	1 00
R. Olney, operator, Struthers, Pa	1 00
S. G. Blanchard, operator, Mahoningtown, Pa	50
G. B. Havens, operator, Leetonia, O	1 00
Ed. T. Thompson, operator, Salem, O	1 00
C. W. Broomhall, operator, Salem, O	1 00
S. J. Williams, ex-operator, Alliance, O	1 00
N. Miller, operator, Alliance, O	50
Frank Wilson, operator, Alliance, O	1 00
M. Shepard, repairer, Alliance, O	1 00
O. M. Blanchard, operator, Canton, O	1 00
J. A. Huntington, operator, Canton, O	1 00
Wm. Wilson, operator, Massillon, O	1 00
C. T. Huntington, operator, Massillon, O	1 00
W. S. Evans, operator, Orrville, O	50
A. J. Noe, operator, Orrville, O	50
Samuel Buttermore, citizen, Orrville, O	50
J. M. Klepper, operator, Wooster, O	1 00
C. H. White, operator, Wooster, O	1 00
A. Gray, messenger, Wooster, O	25
E. C. Hard, operator, Shreve[illegible]ville, O	1 00
H. W. Wynkoop, manager, Crestline, O	5 00
A. W. Wilkins, operator, Crestline, O	2 00
W. F. Perdue, operator, Crestline, O	2 00
L. McCormick, operator, Crestline, O	2 00
J. D. Hinds, operator, Crestline, O	2 00
F. A. Thompson, operator, Crestline, O	2 00
B. F. Blair, operator, Crestline, O	1 50
J. E. Howard, operator, Crestline, O	1 50
J. McClair, operator, Crestline, O	1 50
Frank Enoch, operator, Crestline, O	1 00
J. W. Hoak, operator, Crestline, O	1 00
C. W. Lloyd, operator, Crestline, O	1 00
William Lloyd, messenger, Crestline, O	50
James Guthrie, repairer, Crestline, O	1 00
Ticket Agent, an ex-operator, Crestline, O	3 00
Jno. F. Miller, ex-operator, Crestline, O	1 00
Wm. J. Reed, citizen, Crestline, O	1 00
E. W. Hadley, citizen, Crestline, O	1 00
Dr. H. S. Barbour, ex-operator, Galion, O	1 00
W. V. McCracken, ex-operator, Bucyrus, O	1 00
A. M. McCracken, agent, Bucyrus, O	1 00
M. H. Fulton, operator, Bucyrus, O	1 00
Arthur Smith, operator, Bucyrus, O	1 00
Wm. Franz, citizen, Bucyrus, O	50
A. J. Flaherty, operator, Nevada, O	1 00
G. W. Maxfield, ex-operator, Forest, O	1 00
R. M. Hughes, operator, Forest, O	1 00
H. C. Green, operator, Forest, O	1 00
Jas. F. Richmond, operator, Ada, O	1 00
M. Cochran, operator, Ada, O	1 00
H. T. Moore, operator, Lima, O	1 00
T. E. Carey, operator, Lima, O	1 00
Wm. H. Morrison, messenger, Lima, O	50
Frank C. Smith, operator, Delphos, O	2 00
Charley B. Skeggs, operator, Delphos, O	1 00
Lee Shattuck, ex-operator, Delphos, O	1 00
G. W. Layng, ex-operator, Van Wert, O	1 00
E. S. Metsonagle, operator, Van Wert, O	1 00
J. A. Bassitt, operator, Van Wert, O	1 00
J. M. Metheny, dispatcher, Fort Wayne, Ind	2 00
F. S. Sherick, operator, Fort Wayne, Ind	1 00
C. H. Walton, operator, Fort Wayne, Ind	1 00
C. H. Curtiss, manager, Fort Wayne, Ind	1 00
C. R. Higgins, dispatcher, Fort Wayne, Ind	1 00
F. A. Gorham, ex-operator, Fort Wayne, Ind	2 00
C. D. Gorham, ex-operator, Fort Wayne, Ind	1 00
Owen McGuire, repairer, Fort Wayne, Ind	1 00
Ned Gilmartin, repairer, Fort Wayne, Ind	1 00
J. M. Humphreys, operator, Pierceton, Ind	1 00
E. K. Redrup, operator, Warsaw, Ind	1 00
L. C. Wiltshire, operator, Warsaw, Ind	1 00
J. C. Wilson, agent, &c., Plymouth, Ind	1 00
Ed. Fitzgerald, operator, Plymouth, Ind	1 00
Willie Fitzgerald, operator, Plymouth, Ind	50
A. D. French, operator, Hamlet, Ind	1 00
L. K. Avery, operator, Hanna, Ind	1 00
I. T. Lloyd, operator, Hanna, Ind	1 00
J. T. Saunders, operator, Wanatah, Ind	50
G. A. Dodge, operator, Valparaiso, Ind	1 00
Jno. Shearer, operator, Valparaiso, Ind	1 00
H. P. Woelfer, operator, Clarke, Ind	1 00
V. C. High, operator, Kendallville, Ind	2 00
F. C. Aldridge, operator, Huntertown, Ind	1 00
C. C. Weatherlow, operator, Sturgis, Mich	1 00
C. L. Rood, operator, Brady, Mich	1 00
L. O. Woolley, operator, Mendon, Mich	1 00
L. N. Booth, operator, Plainwell, Mich	50
J. W. Dudley, operator, Wayland, Mich	50
Jas. N. Rust, operator, Grand Rapids, Mich	1 00
H. Daniels, operator, Morley, Mich	2 00
E. Williams, operator, Cedar Springs, Mich	2 00
C. D. Elliott, operator, La Grange, Mich	1 00
C. E. Husted, operator, Chicago, Ill	50
J. N. Neelley, operator, Chicago, Ill	1 00
T. J. Lynch, operator, Chicago, Ill	1 00
O. H. Booth, supt. telegraph, Mansfield, O	5 00
E. V. Anders, manager, Mansfield, O	1 00
Sam'l Uhlich, chief of repairs, Mansfield, O	3 00
W. J. Huggins, operator, Mansfield, O	1 00
W. H. De Long, operator, Mansfield, O	1 00
Jno. V. Davy, operator, Mansfield, O	1 00
Henry Uhlich, repairer, Mansfield, O	1 00
T. D. Butler, operator, Leetonia, O	1 50
Total	$186 00

Lists like these are statues of themselves, of which any living man might well be proud, and are enough to "wake a soul behind the ribs of death" itself. Every man on the list feels better and richer for the money thus given. Mr. Wynkoop deserves all the praise given him by Mr. Booth.

In our issue of October 15th, in the Scioto Valley list, S. Monypenny is credited with 50 cents instead of $1. The footing, however, was correct.

PATONA, ALABAMA.

A. L. Creelman, manager	50
A. L. Creelman, chief day operator	50
A. L. Creelman, chief night operator	50
A. L. Creelman, messenger	50
	$2 00

Mr. Creelman is another man of many offices!

UNION PACIFIC RAILROAD.

D. H. Voorhees, operator, Laramie City, W. T.	$1 00
T. N. Shanks, operator, Red Buttes, W. T.	1 00
W. C. Egan, operator, Hazard, W. T.	1 00
T. C. Eddy, operator, Como, W. T.	1 00
H. H. Williams, operator, Red Desert, W. T	2 00
O. W. Taylor, operator, Fort Steele, W. T.	1 00
J. C. Hart, operator, St. Mary's, W. T.	1 00
W. E. Chidester, operator, Separation, W. T.	1 00
J. H. Laflin, operator, Creston, W. T.	1 00
J. E. Mattoon, operator, Buford, W. T.	1 00
D. W. Springer, operator, Granite Canon, W. T.	1 00
S. H. Garis, operator, Wahsatch, Utah	1 00
J. C. McNevin, operator, Carbon, W. T.	2 00
	$15 00

DEAR SIR: The above is from a few of the boys on the Laramie Division. Sorry there are so few.

Yours, D. H. VOORHEES, Laramie.

SEE WHAT A GOOD HEARTED MAN CAN DO.

CONCORD, N. H., Dec. 12, 1870.

J. D. REID, *Esq.*

DEAR SIR: Enclosed please find $57 for the Morse fund.

Yours, &c., H. N. B.

WHITE RIVER JUNCTION, VT.

H. C. Sherman, sup't's clerk	$2 00
W. E. Huntoon, manager	2 00
C. J. Abbott, operator	1 00
W. S. Nelson, operator	1 00
W. S. Spaulding, operator	1 00
L. S. Hayes, operator and express messenger	1 00
A. A. Huntoon, operator and express messenger	1 00
J. P. Ryan, repairer	1 00
	$10 00

CONCORD, N. H.

Chas. L. Gilmore, manager	$1 00
E. Eugene Eastman, assistant manager	1 00
Frank W. Gledden, operator	1 00
Oliver L. Barron, operator	1 00
Henry H. Morrison, operator	1 00
Wilfred D. Booth, messenger	25
Edmund Paige, messenger	25
	$5 50
W. W. Park, manager, Hydeville, Vt.	$1 00
D. W. Fitzgerald, manager, Watertown, Mass	1 00
H. B. Spencer, manager, Holyoke, Mass	1 00
Frank Marshall, manager, So. Acton, Mass	1 00
Lowell N. Weeks, operator, Wells River, Vt.	50
F. E. Cushman, operator, Oxford, N. H	1 00
G. W. Barrett, operator, Walpole, N. H	1 00
Miss L. D. Prindle, manager, So. Royalton, Vt.	1 00
H. N. Gilson, manager, Waterbury, Vt	1 00
Geo. O. Demick, manager, Barnet, Vt	1 00
H. Judkins, manager, Claremont, N. H	1 00
G. Noonan, operator, Claremont, N. H	1 00
E. J. Parker, operator, Georgia, Vt.	1 00
W. C. Harrington, operator, Georgia, Vt.	1 00
C. L. Knight, manager, Westmoreland, N. H	1 00
Miss M. J. Bancroft, manager, Groton Junction, Mass	50
Geo. C. Randall, manager, Arlington, Vt.	1 00
J. R. Shertleff, manager, Bennington, Vt.	1 00
Andrew Clark, manager, Castleton, Vt.	1 00
F. D. Shaw, operator, Manchester, Vt.	1 00
H. N. Spafford, manager, No. Bennington, Vt.	1 00
E. G. Mason, operator, Rutland, Vt.	1 00
C. E. Clark, operator, Rutland, Vt.	1 00
J. S. Hickok, manager, Vergennes, Vt.	1 00
Chas. H. Smith, operator, Vergennes, Vt.	50
Miss Mary Johns, manager, Vergennes Depot, Vt.	1 00
F. W. Poole, operator, Wallingford, Vt.	1 00
F. A. Durgin, operator, East Andover, N. H	50
P. Leonard, operator, Fair Haven, Vt.	1 50
B. G. Rice, manager, Poultney, Vt.	1 00
Alfred Currier, operator, East Dorsett, Vt.	1 00
A. R. Putnam, manager, Warner, N. H.	1 00
Mrs. M. S. Holt, manager, Leominster, Mass	1 00
M. C. Cutler, manager, Bellows Falls, Vt.	1 00
Miss M. E. Hall, manager, Mason Village, N. H.	1 00
Fred. Harvey, operator, Lebanon, N. H	1 00
Harvey & Dow, op'rs' badge pin m'f's, St. Johnsbury, Vt.	5 00
Mrs. W. C. French, manager, Northfield, N. H.	1 00
Henry Shepherd, supt. repairs, 4th district	1 00
	$57 00

THE FRANKLIN LINE.

HARTFORD, CONN.

FRIEND REID: Here is the opposition Telegraph purse. It includes every one in the office. Will make amount $100 if needed. It is given in honor of Prof. Morse, the "Father of the Telegraph." Hope we are welcome.

Yours truly,

F. H. WHITTLESEY, Manager.

To be sure you are welcome. When we come to honor the "Father," there is but one family. J. D. R.

F. H. Whittlesey, manager	$1 00
J. H. Lounsbury, operator	1 00
W. T. Stone, operator	1 00
E. Miller, operator	1 00
Thomas Dolan, messenger	25
E. J. Buckley, messenger	25
Martin Scery, messenger	25
PATRONS.	
Hartford Daily Times	1 00
Hartford Daily Courant	1 00
First National Bank, J. S. Tryon, Cashier	1 00
J. L. Chapman, Cashier	1 00
Connecticut River Banking Co.	1 00
W. L. Matson, Banker	1 00
N. B. Stevens	1 00
James B. Powell, Cashier	1 00
S. D. Sperry, Treasurer	1 00
Charles E. Buell, manager, Springfield	1 00
Samuel V. Woodruff	1 00
C. J. Mettill, manager, New Britain, Conn	1 00
D. W. Edgecombe	1 00
H. C. Beckwith	1 00
Hartford Steam Boiler Insurance Co.	1 00
	$20 75

FROM THREE PLUGS.

William R. Chadwick, Lawrenceville, Ill.	50
C. C. Judy, Sumner, Ill.	50
E. A. Boyles, Noble, Ill.	50
	$1 50

PONTIAC, ILL.

J. G. Harrigan, manager	$1 00
G. W. McKinney, operator	1 00
E. A. Yost	1 00
	$3 00

NEW LONDON, CONN.

Please accept the enclosed contribution to the Morse Testimonial Fund. Yours truly,

R. S. RAYMOND.

R. S. Raymond, manager	$1 00
C. W. Woodbridge, operator	1 00
Chas. G. Howard, operator	1 00
Peter Mead, messenger	50
M. Fitzgerald, messenger	50
	$4 00

MOUNT JOY, PENN.

Enclosed please find a tiny Christmas present to the Morse Testimonial Fund from

Uriah E. Hoffer, ex-operator	$1 00
Hannah Hoffer, operator	1 00
John M. Shaffner, operator	50
Mary E. Hoffer, manager	1 00
Thank you, Miss Hoffer.	$3 50

MISCELLANEOUS.

W. H. Stephenson, op'r F. W. & W. R. R., Bluff City, Ill.	$1 00
Thomas M. Collins, manager, Marlin, Texas	2 00
L. E. Curtis, manager, Galveston, Texas, (3d)	1 00
S. W. Varney, manager, Communipaw, N. J.	1 00
Henry Cordes, Millersburg, Pa	1 00
John B. Minick, manager, N. West. Tel. Office, Negaunee, Mich	1 00
C. D. Hoyt, New York	1 00
Thos. J. Woolf, Jr., Marwin, Ala	1 00

Only $1,150 are now needed to complete the Fund.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—
JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, JANUARY 1, 1871.

1871.

The New Year comes to the world with a strong and healthy step. Even the battering of the walls of Paris, and the answer of defiant and beleaguered Frenchmen, cannot suppress a regnant idea that the day of the triumph of man and truth is advancing. Meanwhile the commerce of the world goes on much the same, interrupted only in that which it does not need; and the wires, those quiet evangels, while they give Moltke a hundred eyes, and follow to the clouds the vanishing balloon, yet pass by the battle-fields as a busy man passes children fighting in the street, with errands to nations beyond, to give to peace a wider triumph, and to man the suggestions of a better and a nobler future.

We think we can safely say that to America the day comes with unusual consciousness of strength. The elements of society never before mingled with so little attrition. Political questions are to-day mere topics of domestic economies, which we commit to our legislators, and over which none care to fight. Commerce is without unnatural afflatus. Skill generally receives acknowledgment and remuneration. Speculation has largely forsaken the public mind. There is much actual and assured success by the passage of great public industries into the hands of able men. All this means strength and health, for which all men should be grateful. If ever the Divine goodness was apparent in the direction and care of a great nation, it is assuredly so in this. So the hands of friends may be clasped to-day with the gladness which is toned by gratitude.

The Telegraphic interests of the nation are in a similarly healthy state, particularly in this, that the bases of healthful administration are more clearly seen, and the duties of labor more distinctly felt. In the administration of telegraphic property also, it is becoming apparent that to base values on an exhaustive present product, irrespective of the future, is vicious and fallacious. A man has no right to exhaust the soil which is to give his heirs bread; still less so an administrator. Posterity has rights as well as possessors. There is crime in exciting a selling value to property by a product needed to preserve it unimpaired when it passes into other ownership. Another healthy sign is in the growing comprehension of telegraphic frauds, and their modes of manipulation. In perceiving the limits of healthful competition and acknowledging it, there is also an advance.

A greatly needed lesson has also been learned in the matter of ocean cables. Engineers asserted that a cable once laid was a success forever. Could some of the European craft have had their way, land lines would have disappeared wherever a stream could hide a cable. These are now seen to have distinct perils; they have perils also no eye can ever see. To ask a company to be satisfied with simple interest on a property which for months lies dead on six thousand miles of unexplored ocean bottom, hanging, it may be, over deep ravines, cutting on the teeth of coral cornices, slowly wasting over supposable beds of salt, or becoming thin beneath the dance of the mermaids of these lower republics, is asking capital to play the fool. To our mind, no property should be allowed more rapidly to return its original investments to its projectors; nay, we believe government should largely help and provide for this restoration. Once the capital is restored, let liberality have full sway, and the revenue be husbanded only to secure a fund for new lines as the old perish.

The Atlantic Cable Company enter 1871 not without cloud, and yet wisely. Reduced to a single cable, they have established high tariffs to secure the prompt passage of business whose importance could afford the increased rate, and also to maintain an adequate revenue. Low rates are thus seen to be only possible under certain circumstances, either for public accommodation or financial support. Fortunately, the public see and acknowledge the necessity thus created. It is another sign of the general wisdom. Yet we can scarcely praise the company for an act which came from a duty so plain and so imperative. We shall be heartily glad when the disabled cables are restored; meanwhile it cannot fail to excite the thoughtful consideration of all just men to see a gigantic enterprise and a large capital, which have united so long two distant continents, dependent on the continued vitality of a single semi-disabled wire. The snapping of that cord would cause a sigh over the whole earth.

◆

A CASE OF CONSCIENCE.

The manager of a prominent office has been called to a severe trial. His operators respect, and some love him. He is a lovable man. He is as just a disciplinarian as he is lovely. In these days of gifts his subordinates contemplated a brilliant exposition of their esteem in the shape of a grand time-keeper, gold chain, diamond studs, golden shirt &c. The manager heard of it, and, curiously enough, it afflicted him! He didn't see how he could ever scold a boy who had given him the time of day, or whose gift sparkled in his shirt. He had never had occasion to do so to be sure, but it might be necessary. How many sleepless nights came and went to him, we are not informed. But he gave out significantly that he could not accept the gift, and so dried up the flow of love. Was he right? Not a bit of it. He was wrong; very wrong. When authority is so used as to bring out a love which must express itself, it is a good symptom that its exposition is safe. It need not weaken authority. If he only knew it, it would increase his power. He has repelled that which would have assured him of a deeper respect, and his subordinates of a new stimulus to fidelity. We believe in heart service and in all its offerings.

◆

ALL students of electric science will be deeply interested in the article of Rev. H. Highton, taken from the *London Chemical News*, which will be found in this number. Mr. Highton is a frequent contributor on electrical subjects. He now strikes a blow at the received theories of the maximum product of the electro-motive forces in magnetic power. He contends that even with a reduction of the consumption in the battery, magnetic power may be indefinitely increased, or, rather, by the increase of magnetic action on the movement of an armature, battery consumption diminishes. As he himself puts it, the horse eats less by working more. Are we approaching the development of magnetism by inexpensive processes as a popular and cheap motive power? We have no result of actual experiments before us to enable us to form any opinion of Mr. Highton's statements, and therefore regard them as simple problems placed before practical minds for examination. We have long felt that the day was sure to come when magnetism would be utilized for a safe and efficient motive power, and this may be one of the first dawnings of its approach.

◆

PICKETT'S STATUE OF PROFESSOR MORSE.

The heroic-sized statue of Professor Morse, by Mr. Byron M. Pickett, which is to be unveiled in Central Park some time during the month of April, has been completed in clay, and will at once be cast at the National Fine Art Foundry. The manner in which Mr. Pickett has treated this statue merits special commendation, inasmuch as it indicates the progress of a new and improved school of portrait sculpture. Of late years American portrait sculpture has been too generally a weak imitation of the painfully obvious materialism of works which have become fashionable in modern Europe. On both sides of the Atlantic ridiculous failures have been made in attempts to reproduce, by means of modern costume, the severe dignity of antique sculpture.

The incident which the artist has chosen to represent in his statue of the celebrated inventor of the electric telegraph is the reception of his first telegraphic despatch—"See what God has wrought." Professor Morse is represented standing, and with his left hand resting on the instrument from which he has just turned. This action is suggested by the cloak he wears having fallen from his left shoulder, while resting on his right shoulder and over his right arm, which is extended, the hand holding the dispatch just received. The sculptor has thus given a combination of lines that renders the figure interesting from every point of view, and that affords at the same time unwonted scope for the imagination. It is encouraging for American art that Mr. Pickett has shown boldness and ability enough to make a statue in modern costume so judiciously treated as to render materialistic accuracy of detail subservient to heroic and comprehensive representation of character. The familiar and sympathetic qualities of the original are brought out with sufficient strength to be satisfactory to the intimate associates of the living man, while the artist has manifestly looked forward to the time when remote generations shall form a more adequate conception of the great inventor than his contemporaries, whose very nearness causes them to give undue prominence to his social characteristics. In fine, the statue promises to be worthy of the distinguished man to whom this progressive age is indebted for one of its most marvelous and most important inventions.—*N. Y. Herald*

TARIFF NOTES.

In answer to an inquiry why the tariffs to some offices are given as the same as to certain other offices, we have received the following from the Tariff Rooms:

"The rates are usually given as received. It is impossible always to give the rate, because different offices send by different routes.

EXAMPLE.

"Douglass, Ont., tariff same as Pembroke; or

75 from Sackville, N B	50 from Whitehall, N Y
60 from Portland, Me.	60 from Oswego, N Y
60 from Stanstead, Que.	60 from Buffalo, N Y
30 from Montreal Junc.	70 from Detroit, Mich.

"Our offices send business via some of these routes. Referring to Pembroke in the book, they will find the rate and route."

Amesbury and West Amesbury are to be checked direct Square 21, or the special rate of Newburyport, whichever is cheapest. Tariff books to be altered accordingly.

◆

BULLS.

We wish the telegraph was perfect; but it isn't. Sometimes a new hand will make an error that makes a superintendent shiver, and wonder "what next?" Here is a comparatively harmless one, but very delightful. How it must have puzzled the poor soul who received it. The original reads thus:

ERIE, Pa., Dec. 15.

To JOHN JUNE, *Waterford, Pa.*

We over slept ourselves this A. M. Frank will be on No. 3.

D.

It was received thusly:

JOHN JUNE, *Waterford, Pa.*

We are over *in September* ourselves (!) Frank will be on No. 3.

D.

Perhaps the poor operator was sleepy, and he connected sleep with the serene and leafy month that closes the autumn of the year.

◆

Mr. C. O. Rowe, the efficient and excellent Superintendent of the District Central Division, received on Christmas Eve, from the employees of the District and some of his many personal friends, the gift of a very fine watch, Howard movement, costing three hundred dollars. It was a most graceful act to a most worthy man. On the same occasion there was presented to Mrs. Rowe two beautiful and valuable pieces of silver-ware, which would go to show that Mr. Rowe is somewhat indebted to his amiable better half for his popularity. That's so.

◆

We are very gratified to learn that our good friend, Sidney B. Gifford, Superintendent of the W. U. lines between Albany and Buffalo, N. Y., has been presented by the operators of the Seventh Eastern District, with an elegant Jergurson watch and chain, and also a handsome silver tea service, as a testimonial of their regard for him as a man and officer. We know how much this gift was deserved. Mr. Gifford was our choice for the position he fills with such modesty and vigor. He is one of the men who keep the earth steady by the fidelity of their lives, and warm by the purity and glow of their hearts. Here's our hand, Sid. May you live a thousand years. The presentation was made by W. H. Parsons, Esq., Manager of the Utica W. U. Office, in suitable and graceful terms, and the occasion was one of great pleasure to all present. We notice our old friend John J. Flanagan, now of the Utica *Observer*, as one of the presentation party.

◆

GEO. W. CHILDS, Esq., who heads the list for the provision of the granite base for the Morse Statue, and whom all know as one of the princes in journalism, as distinguished for his generosity as his enterprise, sends us the following record of the circulation of the Philadelphia *Public Ledger* for the week ending December 24th, 1870:

Monday, December 19th	74,500
Tuesday, December 20th	74,600
Wednesday, December 21st	73,750
Thursday, December 22d	74,750
Friday, December 23d	74,750
Saturday, December 24th	75,000
Total number of copies for the week	449,250

THE GRANITE BASE FOR THE MORSE STATUE.

On the memorial of many influential citizens of Charlestown, Mass., the Board of Aldermen again passed an act appropriating a sum of money for the Base of the Statue, and we were advised of its acceptance and ratification by both branches of the City Council. It now appears that it failed again on legal grounds, and that it will have the effect of stimulating the citizens to erect another monument to Prof. Morse in his native city.

This failure of course leads us to other sources for the provision of the Base. It will cost at least $1,000. The following gentlemen have offered, with great cheerfulness, to be members of a club of twenty persons, paying $50 each, to provide this amount. We invite others to join it; it is the offer of an honor:

George W. Childs, Esq., Proprietor "Public Ledger," Philadelphia	$50 00
Wm. Cullen Bryant, New York	50 00
Governor Rufus B. Bullock, of Georgia	50 00
Clarence Rathbone, Esq., of Albany, N. Y.	50 00
Hugh Allen, Esq., of Montreal, Canada	50 00
Andrew Carnegie, Esq., Pres. Union Iron Works, Pittsb'g	50 00
Gen. Anson Stager, Gen'l Supt., Chicago, Ill.	50 00
Byron M. Pickett, Esq., sculptor, New York	50 00

◆

H. O. D. says that he is frequently asked who this "Ohms" is who is making so many relays.

◆

THE *Memphis Appeal* contains a notice of a complimentary entertainment given to Col. Coleman, which reflects equal honor on the giver and the recipient. It was a birthday feast to a man whose years never grow old. Age comes to men with lean carcasses and small souls; to men like Coleman, never. We say this even although we ourself have no claims to fatness. May his shadow never grow less.

◆

JOHN CAMPBELL, of Carlisle, Pa., a friend who never forgets us, sent us for Christmas a magnificent turkey, huge and tender. He kindly says, "I hope you will enjoy it as much as I do in sending it." Thanks, old friend, a thousand thanks. Christmas rang in with a merrier chime because of your gift. The old friends are the best yet.

◆

WE read in the *Echo* that the electric telegraph has been put to a new use in Canada. At Mimouski, when the late earthquake came upon them, they sent at once to Quebec, a distance of 200 miles, to ask "How do you feel?" While the operator there was at his work the shock arrived. He at once sent to Montreal, about 200 miles further on, to ask if they had felt it. They had just time to say "No" before the earthquake came up.

◆

MR. G. B. HUBBELL, late Manager of the Western Union Telegraph office at Hartford, Conn., has been appointed Superintendent of the Connecticut River Telegraph Company's lines.

◆

"THE BOY'S TELEGRAPH" is a large monthly paper, published by amateurs, containing interesting stories, sketches, poetry, puzzles, &c., by the best writers. It pleases all. Terms only 50 cents per year. Address L. S. Stewart & Co., box 317, Pittsburgh, Pa.

◆

THE TELEGRAPHERS' BALL. — Notwithstanding the unpleasant weather last evening, Apollo Hall was well filled with the New York telegraphers and their friends, who had assembled to do honor to the annual reunion of this most useful and indispensable class of the community. Among the distinguished guests present were the prominent officers of the Western Union Telegraph Company, and prominent among the veteran telegraphers was Capt. W. O. Lewis, one of the oldest operators in the country. The Associated Press was represented by Capt. Howell. The Reception Committee consisted of J. B. Oltman, M. H. Redding, J. C. Stewart, T. M. Miller, R. M. Mattocks, W. O. Lewis, J. W. Burnham, J. L. Edwards, H. Holland, and J. F. Croie. The Floor Committee was M. S. Roberts, W. H. Collins, G. W. Roberts, John McKeachie, R. J. Hutchinson, J. G. Case, T. T. Dennis, Harry Bertram, G. K. Wolcott, Edward Gordon, W. H. McGibney; and the Committee of Arrangements consisted of M. H. Redding, J. B. Oltman, J. C. Stewart, W. H. Collins, and M. K. Tompson.—*N. Y. Herald.*

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
January 1, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Dec. 15, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

357 Alexandria, Ill.
338 Athens, Ill.
* Bradley, Mich.
* Brady, Mich.
140 Butler, Pa., reopened.
* Covington, Neb.
251 Colon, Mich.
270 Cassopolis, Mich.
251 Centreville, Mich.
230 Dentonville, Mich.
* Dakota City, Neb.
* DeRuyter, N. Y.
* Elk Point, Dac.
361 Hopefield, Ark.
251 Homer, Mich.
* Hackensack, N. J., reopened.
357 Lynn, Ill.
338 Marissa, Ill.
* Martin, Mich.
* Mendon, Mich.
75 Mehoopany, Pa., check Meshoppen, Pa.
* New Paltz, N. Y.
338 Pinckneyville, Ill.
* Pierson, Mich.
357 Rio, Ill.
65 St. Clair, Pa., heretofore an other line office.
33 Suffield, Conn.
* Springvale, Me.
* Stanwood, Mich.
75 Skinner's Eddy, Pa., check Laceyville, Pa.
Toll Gate, Idaho, tariff 338 more than Omaha, Neb.
93 Treeville, N. Y.
251 Tekonsha, Mich.
251 Union City, Mich.
* Vermillion, Dac.
383 Vaughans, Miss.
* Wayland, Mich.
* Yankton, Dac.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Brady, Mich.,	35	2	Kalamazoo, Mich.
Bradley, Mich.,	35	2	Grand Rapids, Mich.
Covington, Neb.,	85	6	Mo. Val. Junction, Iowa.
Dakota City, Neb.,	110	8	Do.
DeRuyter, N. Y.,	20	2	Norwich, N. Y.
Elk Point, Dac.,	100	7	Mo. Val. Junction, Iowa.
Hackensack, N. J.,	Same as heretofore.		Same as heretofore.
Martin, Mich.,	35	2	Grand Rapids, Mich.
Mendon, Mich.,	35	2	Kalamazoo, Mich.
New Paltz, N. Y.,	25 more than Goshen.	2	Same as Goshen, N. Y.
Pierson, Mich.,	45	3	Grand Rapids, Mich.
Stanwood, Mich.,	45	3	Do.
Springvale, Me.,	25	2	Portland, Me.
Vermillion, Dac.,	115	8	Mo. Val. Junction, Iowa.
Wayland, Mich.,	35	2	Grand Rapids, Mich.
Yankton, Dac.,	130	10	Mo. Val. Junction, Iowa.

OFFICES CLOSED.

Athens, N. Y.; Bradford, N. H.; Ellicott City, Md.; Foxboro, Mass.; Jackson, N. H.; Madison, Miss.; Ritchie, Mo., and Wasatch, Utah.

GENERAL INFORMATION.

The P. O. address of Dennison, Summit Co., O., square 180, is Sherman, Summit Co., O.

The "Tariff for Other Lines," from Catlettsburg, Ky to Charlestown, Kanawha Co., W. Va., will hereafter be 65 and 4.

The name of the office heretofore known as Ragged Island, N. S., has been changed to Lockport, N. S., and Nerepis, N. B., to Wellsford, N. B.

Meriden and West Meriden, Conn., are the same place; no charge is made for delivery to the latter.

Messages for Warehouse Point, Conn., are delivered from Windsor Locks, Conn. Charges 25 cents for delivery.

OFFICES HAVING "SPECIAL SHEET A."

Will hereafter check Norristown, Port Clinton and St. Clair, Pa., 15 cents more than "special rate" to Philadelphia.

(*See next page.*)

ATLANTIC CABLE BUSINESS.

CHANGE OF CONTINENTAL RATES.

We are notified of following rates of tariff to places beyond Great Britain, Ireland and France, to take effect January 1, 1871:

From London to	*For 20 words or less, counting address, date and signature.*	
	Ordinary Continental Rate.	*Rate via Falmouth.*
Aden	$7 50	$12 00
Algeria and Tunis	2 00	3 62
Austria and Hungary	1 50	4 38
Baden	1 50	4 12
Bavaria	1 50	4 12
Belgium	84	4 38
Benghazi	5 88	5 88
Bombay, Calcutta and Madras	13 60	14 25
Ceylon	14 60	15 25
China	14 60	15 25
Channel Islands	1 66	
Corfu	2 50	4 38
Corsica	1 04	
Cephalonia, Ithaca and Zante, via Corfu	3 62	5 50
" " " via Volo	2 62	
Denmark	1 25	4 50
Egypt, Alexandria	7 50	7 60
" Cairo and Suez	8 50	8 50
" Suez Canal	9 00	9 00
Gibraltar		2 75
Greece	2 25	
" via Corfu	3 34	5 25
" via Volo		4 50
Holland	1 00	4 38
Italy	1 88	3 75
India, Kurrachee	11 70	12 38
" West of Chittagong	13 60	14 25
" East of "	14 60	15 25
Luxembourg	1 50	4 50
Malta	2 60	2 50
North Germany	1 50	4 38
Norway	1 70	5 00
Papal States	2 08	3 75
Persia	5 80	9 00
Portugal	2 00	2 62
Roumania	1 88	4 50
Russia, in Europe	2 50	5 38
" Caucasus	3 00	
" Siberia, 1st Region	4 00	
" " 2d "	5 62	
Servia	1 63	4 50
Spain		3 12
Sweden	1 75	5 00
Switzerland	1 46	4 00
Syra (Greece) via Corfu		5 88
Tripoli	4 25	4 25
Turkey, in Europe	2 25	4 50
" Asia, seaports	3 88	5 38
" " inland	3 88	6 12
Wurtemburg and Hohenzollern	1 50	4 12

For each ten or fraction of ten words above twenty, charge one-half of above rates.

Charge the "Ordinary Continental Rate" unless specially instructed by the sender to transmit "via Falmouth."

The words "via Falmouth" will be charged for only to London; but other instructions, as "via Corfu," will be charged for entire distance.

Postage from any of the above stations, 37 cents extra.

Messages for China must be directed "Post Galle," as heretofore.

Special tariff by either route to India, Ceylon and China for messages not exceeding ten words:

From London to	*Ten Words.*
India	$9 25
Ceylon and Farther India	10 25
China	10 25
Kurrachee	8 12

Postage from any point, 37 cents extra.

Sender must insert "via Falmouth," if he wishes message so transmitted.

The Belgian Administration suspends, for the present, transmission to points in Belgium of messages relating to arms or munitions of war.

Attention is called to the rule of the Continental Telegraph Companies, under which they refuse to investigate complaints of error or delay, in *unrepeated* messages.

CHANGES IN TARIFF TO OFFICES OF THE MONTREAL TELEGRAPH COMPANY.

On and after January 1st, 1871, the "tariff for other lines" to points on the Montreal Telegraph Co's lines, unless present rate is less, will be as follows:

From Sackville, N. B., to offices in the Provinces of Quebec and New Brunswick, and the city of Ottawa in the Province of Ontario, 25 and 1, gold, or 30 and 2, currency; to all offices in the Province of Ontario, except Ottawa, 50 and 2, gold, or 60 and 3, currency.

From Portland, Me., Stanstead, Que., Montreal Junction, and Whitehall, N. Y., to all offices of the Montreal Co., 25 and 1, gold; or 30 and 2, currency.

From Buffalo, in New York, and Detroit, Mich., to offices of Montreal Co., in New Brunswick, 50 and 2, gold, or 60 and 3, currency; to all others 25 and 1, gold, or 30 and 2, currency.

The present rate, if less than that given in this order, will remain in force.

The gold rate is given for the use of officers in District "A" and "Pacific Division," and for the use and information of managers of offices connecting the lines of the Western Union and the Montreal Co's.

The route of business for the Montreal Company will be via the same connecting offices as heretofore; the tariff to be taken, will, therefore, be indicated by the name of the office in the column headed "leaves this line," in part II of tariff book, opposite the name of the office for which business may be taken.

The following is a complete list of the offices of the Montreal Telegraph Company:

Abercorn, Que
Acton, Que
Acton, G T R, Ont
Acton, Ont
Adams, N Y
Adams Centre, N Y
Ailsa Craig, Ont
Ainleyville, Ont
Alexandria, Ont
Alexandria Bay, N Y
Baby's Point, Ont
Baden, Ont
Baker's Point, N Y
Ballantynes, Ont
Baltimore, Ont
Bangor, N Y
Bark Lake, Ont
Barrie, Ont
Bath, Ont
Bathurst, N B
Batiscan, Que
Beachburg, Ont
Beamsville, Ont
Beauharnois, Que
Beaverton, Ont
Becancour, Que
Bells Corners, Ont
Belleville, Ont
Belleville, G T R Ont
Belleville, N Y
Belle Ewart, Ont
Beloeil, Que
Berkshire, Vt
Berlin, Ont
Cacouna, Que
Caledonia, Ont
Camlachie, Ont
Campbellford, Ont
Campbellton, N B
Canfield, Ont
Canton, N Y
Cape Rouge, Que
Cape Vincent, N Y
Carillon, Que
Carleton Place, Ont
Carleton, Ont
Carron Brook, Ont
Carthage, N Y
Castleton, Ont
Canaapscoil, Que
Cayuga, Ont
Centreville, N Y
Chaudière Junc, Que
Chambly, Que
Dalhousie, N B
Dannemora, N Y
Danville, Que
Danville Junct'n, Me
Davenport, Ont
Deer River, N Y
DeKalb Junction, N Y
Delaware, Ont
Des Joachims, Que
E Sandy Creek, N Y
Ecclesville, Ont
Edwardsburg, Ont
Edwardsburg, G T R, Ont
Falmouth, Me
Farnham, Que
Farran's Point, Ont
Father Point, Que
Fenelon Falls, Ont
Galt, Ont
Gananoque, Ont
Gananoque, G T R, Ont
Garden Island, Ont
Gatineau Point, Que
Georgetown, Ont
Georgetown, G T R, Ont
Hadlow Cove, Que
Hamburg Station, Ont
Hamilton, Ont
Hanover, Ont
Harrisburg, Ont
Ingersoll, Ont
Invermay, Ont
Irish Creek, Ont
Kamouraska, Que
Kemptville, Ont
Almonte, Ont
Altona, N Y
Amherstburg, Ont
Ancaster, Ont
Angus, Ont
Antwerp, N Y
Arnprior, Ont
Arthabaska, Que
Arthabaskaville, Que
Arthur, Ont
Berlin, G T R, Ont
Berlin Falls, N H
Berthier, Que
Bertie, Ont
Bethel, Me
Bethany, Ont
Bic, Que
Black Brook, N Y
Black River, Que
Bloomingdale, N Y
Bluevale, Ont
Blythe, Ont
Bobcaygeon, Ont
Bord e Plouffe, Que
Bothwell, Ont
Bolton, Ont
Boucherville, Que
Bowmanville, Ont
Bowmanville, G T R, Ont
Bradford, Ont
Bradford Station, Ont
Braeside, Ont
Bramley, Ont
Champlain, N Y
Chateaugay, N Y
Chatham, N B
Chatham, Ont
Chatham, Que
Chaumont, N Y
Cheever, N Y
Chelsea, Que
Chippewa, Ont
Clarance, Ont
Clarendon Cent., Que
Clarksburg, Ont
Clayburg, N Y
Clayton, N Y
Clifton, Ont
Clifton House, Ont
Clinton, Ont
Clinton Mills, N Y
Clintonville, N Y
Coaticooke, Que
Des Rivières, Que
Dexter, N Y
Dickinson's Land'g, Ont
do G T R, Ont
Don, Ont
Doucets Land'g, Que
Douglas, Ont
Dresden, Ont
Drumbo, Ont
Eganville, Ont
Elizabethtown, N Y
Ellenburgh, N Y
Elora, Ont
Ernestown, Ont
Fergus, Ont
Fingal, Ont
Forest, N Y
Forrest, Ont
Fort Covington, N Y
Georgeville, Que
Gilead, N H
Gilford, Ont
Glencoe, Ont
Gloucester, Ont
Goderich, Ont
Gorham, N H
Goulds Landing, Ont
Gouverneur, N Y
Harwood, Ont
Hastings, Ont
Havelock, Que
Hawkesbury, Ont
Hemmingford, Que
Henderson, N Y
Iroquois, Ont
Isnore, Que
Island Pond, Vt
Kenmore, Ont
Kalueburg, Ont
Assametquagan, Que
Aston, Que
Aultsville, Ont
Aurora, Ont
Aurora Station, Ont
Ausable Forks, N Y
Ayers Flats, Que
Aylmer, Ont
Aylmer, Que
Ayr, Ont
Brampton, Ont
Brampton, G T R, Ont
Brantford, Ont
Brantford, G T R, Ont
Brasher, N Y
Breslau, Ont
Bridgewater, Ont
Bright, Ont
Brighton, Ont
Brighton, G T R, Ont
Bristol, Que
Britannia Mills, Que
Brockville, Ont
Brockville, G T R, Ont
Brome, Que
Brompton, Que
Brooklin, Ont
Brownville, N Y
Brudenel, Ont
Brushes Mills, N Y
Bryants Pond, Me
Buckingham, Que
Buctouche, N B
Burke, N Y
Cobourg, Ont
Cobourg, G T R, Ont
Colborne, Ont
Colborne, G T R, Ont
Coldwater, Ont
Collingwood, Ont
Combermere, Ont
Compton, Que
Consecon, Ont
Coteau Landing, Que
Coteau, G T R, Que
Cornwall, Ont
Cornwall, G T R, Ont
Corunna, Ont
Cowansville, Que
Craigs Mills, Me
Craigs Road, Que
Creemore, Ont
Crown Point, N Y
Cumberland, Ont
Drummondville, Ont
Drummondville, Que
Duffins Creek, Ont
Duncanville, Ont
Dundas, Ont
Dundee, Que
Dunham, Que
Dunville, Ont
Durham, Ont
Essex, N Y
Etchemin, Que
Evans Mills, N Y
Exeter, Ont
Fort Erie, Ont
Franklin Falls, N Y
Frelighsburgh, Que
Frenchman's Bay, Ont
Grafton, Ont
Granby, Que
Granton, Ont
Greens Point, Que
Greenwood, Ont
Grenville, Que
Grimsby, Ont
Guelph, Ont
Guelph, G T R, Ont
Hespeler, Ont
Heuvelton, N Y
Holland Land'g, Ont
Hudson, Que
Hull, Que
Huntingdon, Que
Isle Verte, Que
Joliette, Que
Kingston, Ont
do G T R, Ont
Kemptville Village, Ont
Keeseville, N Y
La Baie, Que
Lacadie, Que
Lachine, Que
Lachine Junct'n, Que
Lachute, Que
Lacolle, Que
Lake Metapedia, Que
Lakefield, Ont
Lancaster, Ont
Lansdowne, Ont
Laprairie, Que
Madoc, Ont
Madrid, N Y
Magog, Que
Maitland, Ont
Malone, N Y
Mallorytown, Ont
Malton, Ont
Manchester, Ont
Manotick, Ont
Mannsville, N Y
Mansonville, Que
Markham, Ont
Martina, N Y
Martinsburg, N Y
Maskinonge, Que
Massena, N Y
Napanee, Ont
do G T R, Ont
Newboro, Ont
Newburg, Ont
Newbury, Ont
Newcastle, Ont
do G T R, Ont
Newcastle, N B
New Edinburgh, Ont
New Gloucester, Me
Oakville, Ont
Odessa, Ont
Ogdensburg, N Y
Oil Springs, Ont
Old Durham, Que
Omemee, Ont
Paisley, Ont
Pakenham, Ont
Papineauville, Que
Park Hill, Ont
Paris, G T R, Ont
Paris, G W R, Ont
Paris Town, Ont
Paul Smiths, N Y
Patterson, Ont
Pembroke, Ont
Perth, Ont
Peru, N Y
Peterboro, Ont
Petersburg, Ont
Petewawa, Que
Petrolia, Ont
Philadelphia, N Y
Picton, Ont
Quebec, Que
Raymondville, N Y
Redford, N Y
Redwood, N Y
Renfrew, Ont
Rensselaer Falls, NY
Repentigny, Que
Richford, Vt.
Richibucto, N B
Sacketts Harbor, NY
Sand Hill, N Y
Sand Point, Ont
Sandwich, Ont
Saranac, N Y
Sarnia, Ont
Sarnia, G T R, Ont
Scarborough, Ont
Scarborough Village, Ont
Seaforth, Ont
Shakespeare, Ont
Shannonville, Ont
Sharon, Ont
Sherbrooke, Que
Shingle Creek, N Y
Simcoe, Ont
Smiths Falls, Ont
Sombra, Ont
Somerset, Que
Sorel, Que
Southampton, Ont
South Bolton, Que
South Durham, Que
S Hinchinbrook, Que
Tara, Ont
Tavistock, Ont
Teeswater, Ont
Terrebonne, Que
Thamesville, Ont
Theresa, N Y
Thorndale, Ont
Underwood, Ont
Valleyfield, Que
Vankleek Hill, Ont
Walkerton, Ont
Walkerville, Ont
Wallaceburg, Ont
Wardsville, Ont
Warkworth, Ont
Warwick, Que
Waterdown, Ont
Waterford, Ont
Waterloo, Ont
Waterloo, Que
Waterloo Vill'ge, Que
Watertown, N Y
Watford, Ont
Yamaska, Que
Yamachiche, Que
Kincardine, Ont
King, Ont
Kingston, N B
L'Assomption, Que
Lawrence, N Y
Lefroy, Ont
Lennoxville, Que
L'Epiphanie, Que
Levis, Que
Lindsay, Ont
Lisbon, N Y
L'Islet, Que
Listowell, Ont
Little Metis, Que
Matilda, Ont
Meadowvale, Ont
Meaford, Ont
Mechanics Falls, Me
Malocheville, Que
Merrickville, Ont
Metapedia, Que
Metcalfe, Ont
Methots Mills, Que
Metis Grand, Que
Mexico, N Y
Milan, N Y
Millbrook, Ont
Mill Cove, Que
Mill Point, Ont
Milton, Ont
New Hamburg, Ont
New Haven, N Y
New Liverpool, Que
New Lowell, Ont
Newmarket, Ont
Newmarket St'n, Ont
Newtonville, Ont
Newry, Ont
Niagara, Ont
Nicolet, Que
Orangeville, Ont
Orillia, Ont
Ormstown, Que
Orono, Ont
Oshawa, Ont
Oshawa, G T R, Ont
Pierrepont Man'r, NY
Pierreville, Que
Pierreville Vill'e, Que
Plantagenet, Ont
Plattsburg, N Y
Platteville, Ont
Plessis, N Y
Point Claire, Que
Point Fortune, Que
Point Levi, Que
Portage-du-fort, Que
Port Burwell, Ont
Port Colborne, Ont
Port Dalhousie, Ont
Port Darlington, Ont
Port Dover, Ont
Port Elgin, Ont
Port Henry, N Y
Queenston, Ont
Richland, N Y
Richmond, Ont
Richmond, Que
Richmond Hill, Ont
Richville, N Y
Rigaud, Que
Rimouski, Que
River Beaudette, Que
South Paris, Me
Spencerville, Ont
St. Alexandre, Que
Stanbridge Stat'n, Que
Stanfold, Que
St Armand, Que
Stark Water, N H
Stayner, Ont
St Andrews, Que
St Anne, G T R, Que
St Anne la Perade, Que
St Ann bout du L'isle, Que
St Catharines, Ont
St Charles, Que
St Charles en bas, Que
St Cuthbert, Que
St Eustache, Que
St Flavie, Que
St Francis, Que
St Guillaume, Que
St Hilaire, Que
St Hebert, Que
St Hyacinthe, Que
Thornbury, Ont
Thornhill, Ont
Thorold, Ont
Three Rivers, Que
Thurso, Que
Ticonderoga, N Y
Tilsonburg, Ont
Upton, Que
Vaudreuil, Que
Vienna, Ont
Waterville, Que
Welland, Ont
Wellington, Ont
Wellington Square, Ont
West Paris, Me
Westport, N Y
West Shefford, Que
Weston, Ont
W Winchester, Ont
Whitby, Ont
Whitby, G T R, Ont
Widder, Ont
Yarmouth, Me
Knapps, N Y
Knowlton, Que
Komoka, Ont
Londesborough, Ont
London, Ont
do G T R, Ont
Longwood, Ont
L'Original, Ont
Lowville, N Y
Lucan, Ont
do G T R, Ont
Lyn, Ont
Lyn, G T R, Ont
Lynden, Ont
Mitchell, Ont
Moires Corners, Ont
Moira, N Y
Monckton, Ont
Montreal, Que
Monte Bello, Que
Mooers Junction, N Y
Moores Station, Que
Moore, Ont
Morrisburg, Ont
Morton, Ont
Moulinette, Ont
Mount Brydges, Ont
Mount Forest, Ont
Norfolk, N Y
North Stratford, N H
North Troy, Vt
Northumberland, NH
Norton Pond, Vt
Norton Mills, Vt
Norval, Ont
Norwood, Ont
North Yarmouth, Me
Norwich, Ont
Osgoode, Ont
Ottawa, Ont
Otterville, Ont
Owen Sound, Ont
Oxford, Me
Oxford Station, Ont
Port Hope, Ont
do G T R, Ont
Port Neuf, Que
Port Perry, Ont
Port Robinson, Ont
Port Rowan, Ont
Port Ryerse, Ont
Port Stanley, Ont
Port Union, Ont
Port Whitby, Ont
Potsdam, N Y
Potsdam Junct'n, NY
Prescott, Ont
Prescott Junct'n, Ont
Preston, Ont
Prince Albert, Ont
Princeton, Ont
Pulaski, N. Y.
River David, Que
R du Loup en bas, Que
do en haut, Que
Roaches Point, Ont
Rockland, Ont
Rockwood, Ont
Rockingham, Ont
Roxton Falls, Que
Stirling, Ont
St Jean Port Joli, Que
St Julie, Que
St Lambert, Que
St Marys, Ont
St Marys, G T R, Ont
St Nicholas, Que
St Ours, Que
Stittsville, Ont
Stottsville, Que
St Paschal, Que
St Scholastique, Que
Stratford, Ont
do G T R, Ont
Strathroy, Ont
Strathroy Stat'n, Ont
Streetsville, Ont
St Thomas, Ont
St Thomas, Que
St Valliere, Que
Summit, N Y
Sutton, Ont
Sutton, Que
Sweetsburg, Que
Tiverton, Ont
Toronto, Ont
Trenton, Ont
Trenton, G T R, Ont
Trois Pistoles, Que
Turin, N Y
Tyendinaga, Ont
Uxbridge, Ont
Vittoria, Ont
Widder station, Ont
Williamsburg, Ont
Willsborough, N Y
Windsor, Ont
Windsor, Que
Winchester Springs, Ont
Wingham, Ont
Wolfe Island, Ont
Woodstock, Ont
Woodbridge, Ont
Wroxeter, Ont
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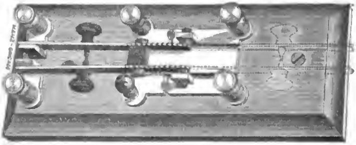

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for measuring resistances, which has the following merits:

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and operators, and for use on telegraph lines, having a range from a small fraction of

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to measure either instruments, lines or insulation with equal convenience.

2. It is made on the

WHEATSTONE BALANCE

principle, which is the most

RELIABLE AND ACCURATE

method of measuring resistances, involving less liability to error than any other.

By this plan it is the resistance itself which is

MEASURED DIRECTLY,

and not some other thing from which the resistance has to be computed by a series of caculations. ts use is therefore

EASILY LEARNED

in a few minutes time.

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LIGHT AND PORTABLE,

the whole being contained in a small box which a man can easily take in one hand like a valise.

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A THIEF WANTED.

During last July a railroad telegrapher, named A. W. Bancroft, came to Albany from Canada, bearing recommendations from the Grand Trunk Railway. He was at once employed by the N. Y. C. R. R. Co., and sent to their Little Falls, N. Y., office to act as assistant ticket agent and telegraph operator, which position he held to the satisfaction of all until the latter part of November last. It was then discovered that he had clandestinely left town during the night of the 28th of that month, or on the following morning, carrying away with him funds belonging to the railroad company to the amount of several hundred dollars. Previous to his departure he had borrowed several sums of money from different individuals in the village; also some articles of value, among which was a flute worth about $45, and several books. It is thought that he has found refuge in Canada.
thinks the affair has become quieted down, when he will move towards some of the roads in the Far West.

It is hoped that the telegraph and railroad men of the States and Canada will assist in ferreting out this fellow, and, to aid them in their efforts, the following description of the person in question is appended: About 5 ft. 8 in. in height, thirty-three years of age, has been broad but is now slightly round shouldered, weighs about 150 lbs., almost perfectly round head with high forehead, straight black hair cut close, dark complexion, well formed large nose, coal black eyes set deep in his head, a thick tuft of black hair on his upper lip, directly under his nose—something unusual; has had the small-pox very bad, and, to hide this, he has grown whiskers all over his face, which are black, and cut quite close. Blushes easily when spoken to, talks slowly, and a great deal about the different railroads he has been on; is an inveterate chewer of tobacco. Any information in regard to his probable whereabouts, or that will lead to his detection, may be communicated to Mr. F. H. Phillips, Train Dispatcher, Eastern Division, and Agent N. Y. C. and H. R. R. R. Co.'s, Little Falls, N. Y.

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

ASSESSMENT NO. 17.

Nos. of Certificates of those who have Paid.

2	103	202	301	392	476	617	714	787	883	960
4	106	208	303	393	478	618	715	790	884	961
6	108	209	306	396	482	622	716	791	885	962
7	111	210	307	399	485	623	717	792	893	963
13	113	211	308	402	509	625	722	798	896	964
15	114	221	309	405	510	626	723	799	897	965
16	126	222	312	406	514	628	724	801	899	966
17	133	228	315	407	515	629	725	802	900	968
21	134	232	316	411	516	630	726	803	901	973
23	138	233	317	412	521	631	727	806	902	974
27	141	235	318	413	527	632	728	809	906	978
28	142	236	319	414	528	634	729	813	907	979
30	144	239	323	417	529	635	734	814	908	980
34	145	240	331	418	530	636	735	816	910	985
35	146	243	333	420	532	637	737	818	915	986
38	148	244	335	422	536	643	738	819	920	987
40	150	246	336	425	540	646	740	821	926	988
42	153	247	337	426	547	648	741	823	928	992
43	154	251	338	427	548	649	742	830	929	993
44	155	253	341	433	552	655	743	831	930	994
46	156	254	343	434	553	656	744	836	931	995
49	157	257	346	438	555	660	747	837	934	996
51	158	258	347	441	556	661	748	838	935	997
52	160	260	350	442	557	662	749	840	938	998
53	162	262	351	443	560	663	750	841	939	1000
55	163	263	353	445	562	664	751	844	940	1002
60	164	264	356	450	565	665	756	850	941	1014
61	166	265	357	451	566	666	758	851	942	1016
67	172	266	359	453	569	669	764	852	944	1017
69	176	267	360	455	570	671	769	854	945	1018
72	177	269	363	456	573	672	772	855	946	1019
73	181	270	364	457	574	673	773	857	947	
75	183	273	366	462	575	674	775	866	948	
80	185	275	367	463	577	676	776	867	949	
83	186	276	374	464	584	677	777	869	950	
84	187	277	378	466	587	685	778	870	951	
89	190	286	380	467	590	686	780	871	952	
90	191	288	381	468	593	695	781	875	954	
93	192	291	382	469	594	697	782	876	955	
94	193	292	383	470	598	700	783	877	956	
95	199	293	385	471	603	710	784	880	957	
97	200	297	390	474	605	711	785	881	958	
98	201	298	391	475	610	712	786	882	959	

ASSESSMENTS RECEIVED—NO. 16.

Mattie L. Smith
A. A. Sprague
W. F. Carter
W. T. Freeman
J. W. Crouse
W. H. Collins
C. H. Rogers
J. Hall
A. A. Smith
S. Dunlop
E. Everts
L. D. Morgan,
W. Frazer, 15 and 16
V. B. De Lee
C. C. Haskins
W. W. Flint
C. K. Skinner
J. A. White
G. W. Bullock,
P. A. Smith, 15 and 16
O. S. Brooks,
E. M. Barnwell, 15 and 16
D. H. Fitch
M. E. Houseman
S. D. Jaques
J. L. Burucker
G. W. Muttart
B. B. Adams, Jr.

J. B. Watt
R. J. Beaumont
E. R. Howe
A. F. Crisey
A. J. Locke
J. C. Mattoon, 15 and 16
A. H. Lincoln
J. R. Dowell
E. McCarthy
J. McGovern
G. W. McGovern
N. C. Pamplin
W. S. Taylor
G. B. Gaines
G. R. Pace
T. A. Pace
T. L. Crouch
J. D. Alley
G. W. Alley
R. O. Crowley
R. M. J. Painter
W. F. Browning
F. N. McMullen
W. A. Miller
H. H. Abrams
J. H. Pressley
J. P. Bogur
R. M. Early

MISCELLANEOUS.

J. C. Hall, 14
J. E. Hadley, 15
W. A. Tinker, 16

J. W. McDonald, 15
H. C. Noe, 15
J. V. Ford, 15

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PAT. APPLIED FOR.

A CARD.

HARVEY & DOW

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HARVEY & DOW,
ST. JOHNSBURY,
Vermont.

A Remarkable Letter.—The appended letter was received a few days ago by a telegraph operator in this city.

"Mister ——

Operatur

Dear Sure

I seat miself an take mi penn in han two rite to you I want two Operate an as i kant git the operater at this stashun two larn me I thot I wood rite two yo an see what yo wood charg me two larn me two Operat I am staing at Pat Bushis an i dont like selyvli mutch, as yo hav larnt sum fellur to Operate I thot mabee yo wood larn me to Operate. i hav got abont un hundred dolars in muny an I want two larn two Operate an I must not use mutch of it or I cannet hav anuf to pay yo an mi bord now what will yo take two larn me two Operate. I ges I can git sum mashenes of a mister bowers he Thinks he wil bee dun with them in a week or two now yo wil se that i kan rite a purty gud han an the operateur heer sez that is al a fellur kneads two mak a gud Operatur now mistur ——— please tuo rite tuo me an let me no whother yo kan larn me tuo Operat or not for if yo kant larn me tuo Operat I ges I wil goe tuo indinopolis tuo Komershel skule tuo larn tuo Operate now plese jest rite tuo me what yo will ax two larn me to Operat I will klos yors truley

——— ——— ———

Slyvil indana
vegow Co ———"

The young man should be sent a box of blue pills.—*Indianapolis Sentinel.*

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Telegraph Instruments and Supplies

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July tf

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$1,000 REWARD

For any case of *Blind, Bleeding or Itching PILES* that Dr. BING'S Pile Remedy fails to cure. It has cured cases of 20 years' standing. Try it, and get rid of the most troublesome disease flesh is heir to. Sold by all Druggists.

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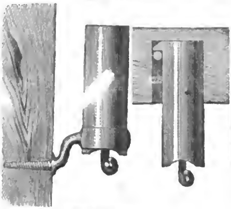

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JOURNAL OF THE TELEGRAPH.

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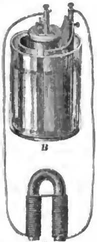
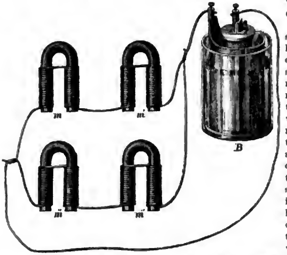
THE LIMITS OF THE MAGNETIC POWER EVOLVED BY A VOLTAIC BATTERY.

By Prof. Phin, Editor N. Y. Technologist.

In a recent number of the *Chemical News*, that for October 28th, 1870, there appears an article by the Rev. H. Highton, M. A., in which occur the following singular passages: "In trying experiments on this subject, the author found that the magnetic power evolved by a given battery could be increased without limit. This was the case both in theory and practice." * * * "By simply increasing the length and section of the wire, the magnetic power may be increased without limit." * * * "Enough has been said to set aside the *à priori* argument against electro-dynamic engines—namely, that as a pound of zinc can only produce a certain amount of heat, and a pound of carbon, which is much cheaper, can produce more heat, therefore electro-dynamic engines can never compete with steam engines. In fact, it is a question of prime cost of machinery and skill in construction, and not of cost of working." The conclusions contained in the above passages are supported by much mathematics and the details of certain experiments, the whole imparting an appearance of extreme accuracy which can hardly fail to lead many into the old wild-goose chase after an available electro-motor. If we accept the doctrines of this writer, then the current theories in regard to the conservation and correlation of force must be abandoned, and Faraday, Grove, Helmholtz, Tyndal, Mayer, Joule, and a host of others, have labored and written in vain. That the paper of Mr. Highton will not mislead any who are thoroughly informed in regard to the laws of electricity is certain, but it is equally certain that such a paper, proceeding from a member of the British Association for the Advancement of Science, and published in a paper having the influence and reputation of the *Chemical News*, will tend to lead many ingenious mechanics to waste time and money in the effort to invent a practical electro-magnetic engine. For the sake of such we propose to consider the subject carefully and at length, and as our experiments in this direction have been neither few nor on a small scale, our readers will have the assurance that we base our statements on something more than mere theory. Divested of mathematical formulæ, the only effect of these being in the present case to render the general statements obscure to ordinary mechanics, Mr. Highton's proposition is that by simply increasing the length and section of the wire, the magnetic power may be increased without limit. In the simple form in which it is here stated, this fallacy has taken possession of many ingenious minds. Even last summer, in this city, an inventor broadly announced that a battery capable of exciting magnetism in one magnet, is equally capable of exciting magnetism in a dozen, and that, therefore, there is no limit to the power that may be obtained from a battery. He even made certain experiments which went to support his theories, but when carried fully into practice the result was failure.



The fully-ascertained and well-known laws that regulate this matter are these: Let *B*, fig. 1, be a battery, and *m* an electro-magnet of the usual form, wound with a single layer of covered wire. When the battery is in action and the connections all made, the magnet will support a weight of say 10 lbs. If now, without increasing the power of the battery, we simply add another layer of covered wire to that which is already on the magnet, we will find that the power is nearly doubled—instead of supporting 10 lbs. only, it will probably support 18 lbs.—the increase being due, apparently, to the mere addition of some copper wire, without the consumption of any more material in the battery, and when the experiment has been concluded, this copper wire is quite as good as it was before it was put in use. If now we add another layer, making in all three layers through which the battery current passes in its course around the magnet, we shall find that the power of the magnet is increased still further. It will now probably support 24 lbs., an increase of six caused by the third layer; and so we can go on—every layer adding to the power of the magnet.



What are the limits to our progress in this direction? They are two: first, the power of the battery to send a current through a sufficiently long wire; and, secondly, the power of the iron core to receive magnetism, or, as it is called, the limit of saturation of the magnet. Now, these two limits have been carefully investigated experimentally, and it has been found that the length of wire which gives the best result is that which opposes a resistance to the current, which shall be exactly equal to the resistance opposed by the cell itself. In other words, the best results are obtained when the external and internal resistances are equal. If the battery contains but one cell the wire must be comparatively short; if we add another cell we double the power with which the battery can send a current through a long wire, and therefore the length of the wire must be increased. If our battery be properly constructed and arranged, it will be found that a much smaller quantity of zinc is consumed when the current is retarded by being made to pass through a great length of wire, and within proper limits this conduces to economy.

The law which we have just stated is rarely complied with by inventors, and the consequence is that they scarcely ever succeed in securing a reasonable measure of economy in their machines. At a recent fair of the American Institute, there was exhibited an electro-magnetic machine, driven by sixteen cells of Bunsen's battery, arranged in consecutive series, or for intensity, as it is called, the wires being very short and stout. Now, in this case the inventor ought to have arranged his battery so as to have produced a current of great quantity, but small intensity. As it was, his zinc burned to waste, just as coal would burn to waste in the furnace of a steam engine, provided the grate surface was enormously large in proportion to the flue or tube surface. Other inventors, having found that this was the case, have been led into a mistake of the opposite kind, and have supposed that the greater the length of wire used the greater would be the economy effected. But experiment shows that after we pass the point at which the external resistance—that is, the resistance in the wire—is equal to the resistance in the battery itself, we cease to obtain a proportionate gain, and our arrangement again becomes economical.

No rule can be laid down in regard to the limit of saturation by magnetism of any given pieces of iron. Different samples of iron vary so much in this respect that we can determine the fact in any given case only after special trials. But in every case it will be found that there *is* a limit which is soon reached, a point beyond which the iron refuses to receive any more magnetism. Long before this point is reached, however, it will be found that every effort to give to our magnet the power of supporting an additional pound, will cost us as much as was required for ten times that amount at the beginning. Thus, suppose we have a small iron core, and that a given current imparts to it the power of supporting 5 lbs.; a current of double the power may, very possibly, make it support 10 lbs., while to make it support 20 lbs. a current of ten times the quantity first employed will be required. But if, on the other hand, we increase the size of the core, we may find that ten times the first quantity of electricity employed will enable the larger magnet to support 50 lbs. instead of 20, and thus the mere increase of the quantity of iron brought into action will increase the actual result obtained. This is the case in the particular form of experiment adopted by Mr. Highton. It is true that he has made a special arrangement of his magnets, but this would not affect the result, except under certain circumstances coming under the first law that we stated. Aware, apparently, of the fallacy of supposing that power can be obtained beyond a certain point by mere increase in the length of the wire, Mr. Highton divides his current as shown in fig. 2; the effect of which is simply to double the size and length of the greater part of the wire, while the aggregate amount of iron contained in the cores is four times that used in figure 1: no wonder, therefore, that he gets an increase of power, though to say that he can go on increasing the power *without limit*, is to assert that to which carefully conducted experiments will give a flat denial. The peculiar proportions of his particular magnet, wires and batteries, has, no doubt, afforded him data which has led him to suppose that the amount of power obtained bears a simple ratio to the amount of wire employed. A wider range of experiment would have shown the fallacy of this. In experiments made to determine this very point, we have employed magnets of which the cores weighed from a few ounces up to 130 lbs., and the coils of covered wire measured from a few yards up to several miles. The conclusion at which we have arrived is this: the influences which impose a limit upon the amount of magnetism that can be imparted by a given battery to an unlimited amount of iron are two fold—first, the fact that if we multiply the amount of iron, either by increasing the size of the core or multiplying the number of cores, we require an amount of wire which soon brings us within the limits of the law first stated; and, secondly, that the very magnetization of the iron core increases the amount of the resistance in precisely the same manner as would an increase in the length of the wire itself, and thus virtually shortens the length of wire that is desirable in a true economical arrangement. To take a practical example: supposing that we have a battery consisting of a single cell, what is the proper quantity of iron to be used in order to secure the greatest economy? In the first place, then, we must find the proper length of wire that ought to be employed. Suppose this to be 500 feet. The question then resolves itself into one regarding the proper amount of iron to which 500 feet of wire can be applied, it being remembered, of course, that the size of the battery cell governs the size of the wire, while the number of cells that are placed in series governs the length of the wire.

It is obvious, at first sight, that if the iron core be too small, it will be incapable of receiving the amount of magnetism that the wire is capable of imparting. In other words, it will be saturated with magnetism long before the full effect which the wire is capable of producing has been reached. On the other hand, if the iron core be too large, the number of layers of wire will be so small that the amount of magnetism excited will be comparatively slight—the absolute supporting power being in fact less than may be obtained from a much smaller core, to which the given amount of wire has been more judiciously applied. Nor are the limits in this case at all beyond the range of the magnitudes employed in practical operations. To test it I have compared my large iron core, weighing 130 lbs., with another weighing 40 lbs., the battery and wire employed in both cases being the same—a single cell of Grove and 500 feet of covered copper wire No. 12. The small core supported the greatest weight, although by increasing the length of wire and multiplying the number of battery cells an entirely different result was obtained. With ten Grove's cells and 5,000 feet of wire, the large core will support a weight greater than that which *any* amount of wire and *any* number of battery cells would enable the small core to sustain. These general principles, which are within the comprehension of any mechanic of good sound common sense, cover the whole ground, and the experiments detailed by Mr. Highton do not contradict them. Fig. 1 shows his first arrangement of the battery and magnet, while by the arrangement shown in Fig. 2 he professes to have doubled the amount of power obtained from the same battery, and assuming that this process may be repeated *ad infinitum*," he rushes at once to the singular conclusions expressed in the passages we have quoted at the commencement of this article. Let us therefore consider more particularly the case of the magnets shown in Fig. 2. There it will be observed that he divides the current into two parts—one going round one pair of magnets, and the other round the second pair. It is obvious that the effect of this is simply to increase the size of the wire, while its length remains the same, and the increase of effect arising from this source will depend upon the relation between the size of the single wire and the size of the battery. If the cell be very small, and the wire that is used be very stout, the effect will be simply to divide the current into two equal parts without materially increasing its force. If, however, the battery cell is very large, and the wire so small as to be incapable of carrying the current, then the addition of another wire may actually serve to nearly double the force of the current. But it does not follow that this process can be "repeated *ad infinitum*." The other feature of his new arrangement, the introduction of four magnets instead of one, serves merely to increase the size of the iron core. As previously stated, up to a certain point the core may be increased with advantage, but there is soon found a limit beyond which it is not advisable to go. Mr. Highton's magnets are, however, so far within this limit that it is no wonder that an increase of four times the amount of wire and iron gives double the power, but it will be seen that, by his own showing, the last half of his power costs three times as much as the first half.

Before leaving this subject there is one point to which we wish to allude, as it has often proved an *ignis fatuus* to workers in this department. Over and over again, we find men devising forms of magnets in which tubes are substituted for the solid cores, or the core is composed of fine wires tied into a bundle, or a large number of small magnets is used instead of one large one. No marked advantage seems to arise from these changes, or at least, what is gained in one direction is lost in others; and while we would not for a moment discourage patient investigation, it would be well for inventors to find out whether their supposed novelties are not old before they spend much time and money on them.—*N. Y. Technologist.*

NEW YORK CHAMBER OF COMMERCE.

TELEGRAPHY.

Mr. Samuel B. Ruggles, from the standing Committee on Telegraph Affairs, etc., presented the following report, which was ordered to be printed:

A sub-marine telegraph under the Pacific Ocean forms an all-important link in the general telegraphic chain, or system, to surround the globe. This great circle may be best described and understood in segments, showing their various extent by degrees of longitude. It embraces two grand divisions, each containing a continent and an ocean. The western embraces the Western continent and the Atlantic Ocean, extending from San Francisco, in California, to Valentia, in Ireland, with 112 degrees of longitude; while the eastern embraces the Eastern continent and the Pacific Ocean, extending from Valentia to Shanghae, in China, with the remaining 248 deg. of longitude, of which the eastern continent covers 132 deg. and the Pacific Ocean the remaining 116 deg., thus completing the entire circle of 360 deg. Of these two segments of this terrestrial line, the first, from San Francisco to Valentia, has been finished largely, if not mainly, by the energies of the citizens of the United States. Of the remaining segment, the portion covered by the eastern continent is now nearly completed. Two continuous lines extend eastwardly from Valentia—one taking a northerly direction through the United Kingdom, Germany, European and Asiatic Russia, to the present temporary terminus at Kiachta, an important Russian entrepot in Eastern Siberia, near the Chinese frontier, in north latitude 61 deg. 5 min.; the other pursuing a southeasterly course toward the Equator, through France, Austria, Turkey, Persia and other Asiatic countries, to Hindostan, at Bombay, and thence to Point de Gall, in Ceylon, near the Equator, to N. lat. 6 deg. Kiachta is 118 deg., and Ceylon 88 deg. east from Valentia. This land line through Turkey and Persia being liable to occasional interruption in regions only partially civilized, a sub-marine line has also been laid from Italy through the Mediterranean Sea, the Red Sea, and the Arabian Sea to Bombay.

By the lines above described commercial and other messages are now regularly telegraphed without interruptions from London to Kiachti and Ceylon. The charge from London to Ceylon for ten words is $10 25 in gold; from New York to Ceylon, $15 25. The steamer-letter postage from Ceylon to Hong-Kong, near Canton, is thirty-seven cents, and the time of passage from fourteen to sixteen days. The committee have learned on good authority (the commercial agent of A. A. Low & Brothers, residing at Hong Kong, and now in New York) that active measures are in progress for extending a sub-marine telegraphic line from Ceylon to Singapore, through 25 deg. of longitude, which will probably be completed by the 1st of March next. Singapore lies only 3 or 4 deg. north of the equator, and has become an important focal point in the commerce of the East. It was founded by the British Government in 1624, and already enjoys a yearly commerce of nearly $50,000,000. The distance from Singapore to Hong Kong is about 1,400 miles, the steamer mails being carried in six days. A sub-marine telegraph line is now in progress, and will probably be completed within the present year or the year following. A sub-marine line is also in active progress from Hong Kong to Shanghae—about one thousand miles. The newspaper *Overland Mail*, published at Hong Kong, states that the wire has all arrived, so that the steady completion of the line is now assured. Induced by political or religious scruples, the Chinese Government has hitherto prohibited the laying of any telegraphic line on their territory, so that the terminus of the line on the Eastern continent will probably be fixed for a time in the light-ship near the coast of Shanghae. At this important point the junction between the northern and southern lines will be made through the enterprise of a Danish company at Hong Kong, now actively constructing a line on land from Kiachta, about fourteen hundred miles, to the Sea of Japan, and to be extended by a line under its waters, of about eight hundred miles to Shanghae. The completion of these lines on the Eastern continent, in connection with the lines now established in the Atlantic and upon the Western continent, will afford to the merchants of the United States, without any line in the Pacific, a constant telegraphic communication, not requiring more than three days at the utmost, with every important commercial point in the civilized world north of the Equator. Similar facilities will soon be extended to the southeastern hemisphere by the Australian branch, leading southeastwardly from Singapore through, or along the coasts of Java and the other islands of the great Eastern Archipeligo, into Australia as far as Melbourne in 37 deg. south lat. It is especially noticeable that the commerce of the United States with this interesting portion of the globe just entering on its career of civilization, is rapidly increasing to importance. The exports of the United States to Australia alone in 1868 were $4,848,000, exceeding by one-fourth the total exports to all the nations around the Baltic, which were only $3,631,000. It must be manifest that the commercial interest of the United States would be greatly benefited by a telegraphic line leading directly across the Pacific, while its peculiar value in war, in properly directing naval operations in these distant waters, can hardly be overestimated. Two telegraphic lines under the Pacific have been suggested to the committee, one commencing at San Francisco in latitude thirty-seven degrees, and deflecting southwardly to the Sandwich Islands in latitude twenty degrees, and thence inclining northwardly by way of the Midway Islands in latitude twenty-seven degrees north of Yeddo, in Japan, in latitude thirty-five degrees north, and thence southwardly to Shanghae in latitude thirty-two degrees. Its length will be 6,615 nautical miles. The other and more northern line will extend from San Francisco along the coast of British Columbia and Alaska, and thence near the Aleutian Islands, to the Eastern coast of Russia, and thence along the coast of Japan to Shanghae in China. It is claimed that this line will be shorter than that by the way of the Sandwich Islands. The committee do not desire to pass any judgment on the merits of the two lines in question. They would only insist on the vital importance of keeping any and every telegraphic line under the Pacific, or any other ocean or sea, as far as possible, free from any exclusive privilege or monopoly. The ocean and seas were created for the common use of man, and should not be exclusively appropriated by any individual of any nation or race. Before this intelligent Chamber of Commerce it can hardly be necessary to advert to the transcendant importance of a world-encircling telegraphic system, diffusing through all the markets daily information of the current prices, and the condition of products and cargoes. Under the wide-spread solidarity of commerce now recognized, any commercial facilities secured for a part become facilities for the whole. With this view the committee have deemed it useful to collect and present in tabular form the amount of foreign commerce of the various civilized nations, and especially of their commerce on the Pacific and Indian Oceans. The result in round numbers is a total foreign commerce exceeding eight thousand millions of dollars, of which Great Britain, France and the United States have more than five-eighths. The particulars are contained in the tables accompanying the present report.

By order, SAMUEL B. RUGGLES, Chairman.

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AUTOMATIC TELEGRAPHS

Various attempts have been made from time to time to perfect a system of automatic telegraphy, so that skilled operators manipulating the "key" will be no longer a necessity in the large telegraphic offices; but they have all, thus far, proved to be impracticable. The first telegraphic line (that between Baltimore and Washington, put up by Prof. Morse), was automatic in its operation, but it worked too slowly to be made of practical utility. In 1848, Alexander Bayne, of Edinburgh, invented an automatic apparatus. Instead of the movable types used by Prof. Morse, he substituted punches making dots and lines, which were transferred to the tape by an inked brush He gave up the invention, however, on account of its impracticability for purposes of speedy transmission. In 1845, Messrs. Semens & Holsky, of Berlin, brought out an automatic machine, and connected it with a line running from Warsaw to St. Petersburgh, but it was found impossible to make it punch fast enough to be of any utility. Mr. John P. Honniston, of New Haven, in 1857, invented a punching machine, but it failed for the same reason. In 1858, Prof. Wheatstone took out a patent in England for a punching machine of his invention, but it worked too slowly and too expensively to be made useful. He sold his patent to the British Government afterwards, but it has never been utilized. In 1862, Mr. Semens, of Berlin, made another effort to perfect an automatic telegraph, and went back to the old type system of Prof. Morse, but his invention proved to be a failure for the second time. Since then, in 1869, he has made another apparatus, on the principle of Mr. Bayne's process of punching and transferring the indentations, in ink, to a paper band; the improvement consisting in having keys like a piano, or like what is known as a printing telegrapher. As yet no practical result has followed this invention. In 1869, Mr. George Little, of New Jersey, patented an apparatus on Bayne's principle, and it was operated on a wire between Philadelphia and Washington, but its success is as yet, to say the least of it, problematical. The results achieved in automatic telegraphy, thus far, would require nine operators to do as much work in a given time as one skilled operator can turn off with the key machine, now in universal use in all large offices. Mr. George B. Prescott, one of the ablest electricians in the country, has put on record his opinion of the efforts at automatic telegraphy, as follows:

"In reply to the statement from the pamphlet of the National Telegraph Company, that 200 words per minute have been transmitted by the automatic process on one wire over a circuit of 2,000 miles, I would remark that this result is totally inconsistent with the well established laws of electric transmission, and could not possibly have been accomplished upon any telegraph line of that length in existence, except by providential intervention. The statement, therefore, is either incorrect, or a miracle was wrought in aid of this particular experiment, which I am not prepared to admit. On the contrary, I deem it much more probable that an error was made in the experiment, and conclusions hastily jumped at which were not warranted by the facts.

"The distance said to have been worked through by the automatic system—2,000 miles—is the same as between New York and Salt Lake City, and the battery used was twenty-eight cups, or the same as is employed to work a line of 250 miles in dry weather. So far from this battery having power to work a wire 2,000 miles long during a heavy rain storm, its force would be entirely exhausted in less than half that distance."

Many persons predict that telegraphy will, in course of time, supersede the necessity for great mail facilities, and that, instead of writing letters and sending them by post, all communications will be transmitted over the wires, the cost of telegraphing being eventually so reduced as to bring the use of the telegraph within the reach of the humblest person. This may be rather too great a stretch of hopefulness, but, judging from what has been done in the past, it is unsafe to make positive assertions as to what may or may not be in "the womb of the future."—*N. Y. Times.*

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SPEED OF THOUGHT.

WHEN it comes to the relation of mental action and time, we can say with Liebnitz, "Calculemus," for here we can reach quantitative results. The "personal equation," or difference in rapidity of recording the same occurrence, has been recognized in astronomical records since the time of Maskelyne, the royal astronomer, and is allowed for with the greatest nicety, as may be seen, for instance, in Dr. Gould's recent report on trans-Atlantic longitude. More recently the time required in mental processes and the transmission of sensation and the motor impulse along nerves have been carefully studied by Helmholtz, Fizeau, Marey, Donders, and others. From forty to eighty, a hundred, or more feet, a second are estimates of different observers, so that, as the newspapers have been repeating, it would take a whale a second, more or less, to feel the stroke of the harpoon in his tail. Compare this with the velocity of galvanic signals, which Dr. Gould has found to be from fourteen to eighteen thousand miles a second through iron wire on poles, and about sixty-seven hundred miles a second through the submarine cable. The brain, according to Fizeau, takes one-tenth of a second to transmit an order to the muscles, and the muscles take one-hundredth of a second in getting into motion. These results, such as they are, have been arrived at by experiments on single individuals with a very delicate chronometric apparatus. I have myself instituted a good many experiments with a more extensive and expensive machinery than I think has ever been employed, namely, two classes, each of ten intelligent students, who, with joined hands, represented a nervous circle of about sixty-six feet, so that a hand pressure, transmitted ten times round the circle, traversed six hundred and sixty feet, besides involving one hundred perceptions and volitions. My chronometer was a "horse-timer," marking quarter seconds. After some practice, my second class gradually reduced the time of transmission ten times round, which had stood at fourteen and fifteen seconds, like that of the first class, down to ten seconds; that is, one-tenth of a second for the passage through the nerves and brain of each individual; less than the least time I have ever seen assigned for the whole operation; no more than Fizeau has assigned to the action of the brain alone. The mental process of judgment between colors (red, white and green counters), between rough and smooth (common paper and sand paper), between smells (camphor, cloves and assafœtida), took about three and a half tenths of a second each; taste twice or three times as long, on account of the time required to reach the true sentient portion of the tongue. These few results of my numerous experiments show the rate of working of the different parts of the machinery of consciousness. Nothing could be easier than to calculate the whole number of perceptions and ideas a man could have in the course of a lifetime. But, as we think the same thing over many millions of times, and as many persons keep up their social relations by the aid of a vocabulary of only a few hundred, or, in the case of some very fashionable people, a few score only, of words, a very limited amount of thinking material may correspond to a full sense of organs of sense and a good development of the muscular system. The time relation of the sense of vision was illustrated by Newton by the familiar experiment of whirling a burning brand, which appears as a circle of fire. The duration of associated impressions on the memory differs vastly, as we all know, in different individuals. But in uttering distinctly a series of unconnected numbers or letters before a succession of careful listeners, I have been surprised to find how generally they break down in trying to repeat them between seven and ten figures or letters, though here and there an individual may be depended on for a large number. Pepys mentions a person who could repeat sixty unconnected words forward or backward, and perform other wonderful feats of memory, but this was a prodigy. I suspect we have in this and similar trials a very simple and mental dyanometer, which may yet find its place in education.—*Dr. Holmes.*

THE INVENTIVENESS OF FRAUD.

During the last few months a paragraph has been in industrious circulation, stating that a company had been organized in England, entitled the London and New York Direct Telegraph Company, and that £600,000 of their capital had been already raised. The cable was also stated to have been ordered, and was under contract to be laid in August of the present year, between the coasts of Wales and Rhode Island. Everything was stated with so much particularity that it was, of course, widely credited. The presses, who cheer everything on which is likely to aid themselves, of course cheered this; and we ourselves supposed that about the time apples were again ripe little Rhode Island's sides might be tickled with English lightning. We admired the dexterity of the supposed contractors in placing ocean telegraph stock under present circumstances, and wondered at the wealth which was thus so easily tapped and appropriated. A friend of ours, however, thought it worth while to inquire into the matter, and addressed himself to parties who have thorough means of knowing the history of all such matters. The result was that, after careful inquiry, it was proved that at none of the cable establishments in England was there any such order being executed, and, so far as known, no capital had been raised for that or any other Atlantic cable, nor was there likely to be. Thus went the wind out of that bag. It was a scheme to raise the wind by seedy and greedy men in America. We should suppose that the experience of the present company would, for a time at least, deter all enterprizes of this kind, viewed as an investment. And yet there is no concealing the fact that a permanent connection with Europe by cable is becoming every day an imperious necessity, and one for which the present Company must leave no means untried to provide, if they would secure themselves against new projects, or the reprobation of the nations who, once united by this ligament of fire, demand that it be made perpetual. We hope the broken cables will soon be repaired, and the peril of non-intercourse be removed.

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ANSWERS TO CORRESPONDENTS.

Is it absolutely necessary to have a signature to every message? I have one the sender refuses to sign and receiving operator refuses to take. I still hold money and message. How about it?

For a reply to the above inquiry, our correspondent is referred to the Journal of the Telegraph of Nov. 15, 1870.

Rule 20 provides that, "no office shall refuse to receive and forward, or deliver, any message from any other office, unless it should endanger life or property, In which case the receiving office will hold such message until advised by the District Superintendent." The sending office is thus made the judge of the propriety of the messages taken in at his office for transmission, and the receiving operator has no right to decline to receive them.

In the above case, the receiving operator appears to have acted in an arbitrary and indefensible manner in refusing to take the message, and his conduct should be promptly reported to the Superintendent.

AN ACT

TO AUTHORIZE CHARLES GRAFTON PAGE TO APPLY FOR AND RECEIVE A PATENT.

Be it Enacted *by the Senate and House of Representatives of the United States of America in Congress Assembled:*

That the Commissioner of Patents is hereby authorized to receive and entertain a renewal of the application of Charles Grafton Page, for Letters Patent for his "induction apparatus and circuit-breakers," now on file in the United States Patent Office, including therewith his circuit-breakers, described by him prior to said application, and that if the Commissioner shall adjudge the said Page to have been the first inventor thereof, he shall issue to him a Patent, which Patent shall be valid, notwithstanding said Page's invention may have been described or in use prior to said application, and notwithstanding the fact that said Page is now an Examiner in the United States Patent Office: *Provided*, That any person in possession of said apparatus, prior to the date of said Patent, shall possess the right to use, and vend to others to use, the said specific apparatus in his possession, without liability to the inventor, patentee, or any other person interested in said invention or patent therefor.

Approved March 19, 1868.

Induction-Coil Apparatus and Circuit-Breaker.—Charles Grafton Page, Washington, D. C.

I claim, 1. An induction-coil apparatus, consisting of a primary and secondary circuit, when said secondary circuit is many times, that is to say, two, three, or more times the length of the primary circuit, having the connections so arranged that shocks, sparks, and electrostatic results may be obtained from the secondary circuit alone, or from the combined primary and secondary circuits, or from the primary alone, or from portions of either circuit, substantially as set forth.

2. The combination of an automatic circuit-breaker, with either a primary coil alone, or a primary and secondary coil combined, substantially as set forth.

3. The combination of a mechanical circuit-breaker with a primary and secondary coil combined, substantially as set forth.

4. The combination of both a mechanical and automatic circuit-breaker, with a primary and secondary coil combined, substantially as set forth.

5. The combination of a primary and secondary coil, inclosing an electro-magnet, with an automatic circuit-breaker, substantially as set forth.

6. The combination of a primary and secondary coil, inclosing a compound or divided electro-magnet, with an adjustable automatic circuit-breaker, substantially as set forth.

7. The combination of a primary and secondary coil, inclosing a compound electro-magnet, with an attached hammer circuit-breaker, substantially as set forth.

8. The spark-arresting circuit-breaker, whether used with a primary coil alone, or a primary and secondary combined, substantially as set forth.

9. The spark-arresting circuit-breaker, whether used with a coil or coils, inclosing an electro-magnet, substantially as set forth.

10. The spark-arresting circuit-breaker, whether attached to or independent of the primary or primary and secondary coils, substantially as set forth.

11. The adjustment of the retractile force of an automatic circuit-breaker, substantially as set forth.

12. In combination with such adjustment, adjusting the distance of the hammer or the armature from the pole or poles of the electro-magnet which actuates them, as set forth.

13. Adjusting or regulating the length of vibration of the circuit-breaking bar, by means of a set-screw, or any mechanical equivalent for substantially the same purpose, substantially as herein set forth.

14. The employment of one electro-magnetic instrument to open and close the circuit of another electro-magnetic instrument, using either one battery for both, or separate batteries for each, substantially as set forth.

15. The employment of separate and independent batteries to operate an electro-magnetic circuit-breaker, and the circuit which is broken by it, substantially as set forth.

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The cable between Malta and Tripoli has ceased to work.

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The non-receipt of the *London Electric Telegraph Review*, since its issue of November 19, induces the belief that it has been suspended. We much regret this. It was admirably conducted, and we were indebted to it for much valuable matter. There was really no room for it in England. Operators there could not subscribe for it, and there is such a wealth of engineering literature, weekly and monthly, that all that was valuable in electric science found its way to their columns. Still we regret that the *Electric Review* has ceased to be.

TESTIMONIALS.

H. C. Maynard, Esq., night manager of the Western Union Telegraph office of this city, was last night presented with an elegant gold watch chain, the gift of the night operators, as a token of their respect and esteem for him as a gentleman, ever uniform in courtesy to all; as a manager, ever faithful in the conscientious discharge of his duties.

Gratifying Testimonial to T. M. Robinson, Esq.—The following address speaks for itself, and reflects great credit on the gentlemen connected with the staff of Telegraphers. We need hardly add that the compliment paid to Mr. Robinson is well merited:

St. John, N. B., Christmas, 1870.

Thomas M. Robinson, Esq., Manager W. U. Telegraph Office, St. John:

We, the employees of the Western Union Telegraph Company in St. John Office, beg leave to present to you our Christmas greetings, and to request your acceptance of the accompanying Gold Mounted Pencil and Penholder, as a slight token of our esteem and confidence. We look back with great pleasure and satisfaction on the gentlemanly and generous manner in which your official duties have been discharged, and we heartily unite in the best wishes for yourself and family.

Believe us, sir, respectfully yours,

B. S. Black,
F. W. Jones,
E. T. Barberle,
Geo. S. Dodge,
J. F Edgar,
W. F. Rogers,
Thos. C. Wetmore,
J. P. Rankin,
Geo. A. Robinson,
A. Williams,
E. L. Betts,
F. W. James,
E. B. Carwell,
J. P. Till,
David C. Dawson.

Mr. Robinson gave a verbal reply, expressing himself highly pleased with the gift, and with the gentlemen by whom it was given. He felt it peculiarly gratifying to find such a friendly feeling manifested towards him by those with whom his official duties had brought him into such intimate relations.

Christmas Gift.—We are pleased to know that R. T. Clinch, Esq., Superintendent of the Western Union Telegraph Company's line in New Brunswick and Nova Scotie, was presented by the Lady Telegraphers of the latter Province with a very appropriate and costly Christmas gift, in the shape of a handsome Bible, which was imported from England expressly for the purpose. On the cover of the volume is a large gold plate with "R. T. Clinch, St. John," beautifully engraved thereon.

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AUTOMATIC TELEGRAPHY.

Messrs. Editors:—In your issue of December 17th is a reply (by that eminent electrician, Moses G. Farmer, Esq., of Boston) to an article upon the subject of "Automatic Telegraphy," by George B. Prescott, Esq., the talented electrician of the Western Union Telegraph Company.

With your permission, I would like to call the learned Professor's attention to an inadvertent omission on his part of a fact now well known to experts in the exact science of telegraphy, namely: it being possible, under certain conditions, to transmit telegrams over a line composed of No. 8 iron wire, 250 miles long, at almost any rate of speed up to 2,000 or more words per minute.

Yet, notwithstanding the fact here stated, I should, under all circumstances, prefer and also recommend the use of the (to me) beautiful compound wire, composed of steel and copper, on account of its superior strength and great conductivity, requiring at the same time only one half the number of poles per mile; and requiring also a less amount of electro-motive force to operate the machinery used in connection therewith.

George Little.

Rutherford Park, N. J.

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Correction.—In the article on Boyd's new Morse alphabet, in our issue for December 15, "providentially represent" should have been "provisionally represent."

THE MORSE STATUE.

As the present list closes, there remains only a balance of $871 26 to complete the cost of the Statue. Of the receipt of that amount we have no doubt. From the beginning we have cast ourself upon the pluck and manliness and public spirit of the American craft, and made contracts as if the whole fund was in hand. On the 9th inst. the foundation was finished. It is built on the solid rock which was found five feet below the surface of the ground, and the masonry of the base was done under the supervision of N. B. Frost, Esq., one of the oldest builders of New York, and is as solid as if made of a single stone. The base is now making in the quarry of Quincy, Mass., and will be in its place by March 15th. The bronze statue will be in its place by April 10th, to await its unveiling on the 27th. So all goes well. The statue will be erected without a dollar remaining unpaid upon it. We risk our faith on that result.

RECEIVED SINCE LAST ISSUE.

James D. Reid, New York (2d sub)	$10 00
Stephen D. Field, San Francisco, Cal	5 00
William S. Hotchinson, operator, Columbia, Cal	10 00
Anna C. Buchanan, manager, Marietta, Pa	1 00
C. M. Kinnamon, manager, Tiffin O.	1 00
G. V. R. Frost, manager, Peekskill, N. Y.	1 00
A. W. Kittredge, lineman, Boston, Mass	1 00
Jack Wallace, lineman, Boston, Mass	1 00
A. J. Lapham, lineman, Boston, Mass	50
W. H. Scarborough, lineman, Marshall, Texas	1 50
W. B. Taylor, Florence, Ala. (2d sub)	1 50
W. C. Havens, New York, (2d sub)	$1 00
John E. Simpson, So. Newmarket, Boston & M. R. R.	1 00
J. C. Chilton, operator, Laraca, Texas	50
Frank Voelcker, operator, San Marcos, Texas	1 00
A. H. Morris, operator, Magnolia, N. C.	1 00
John B. Harman, manager, Charlotteville, Va.	1 00
C. K. Skinner, agent and operator C. & W. R. R., Woodbine, Iowa	1 00
Montrealer	1 25

PENNSYLVANIA R. R.—MIDDLE DIVISION.

A. P. Kiefer, Harrisburgh, Pa	$1 00
Miss E. Cogley, Harrisburgh, Pa	1 00
Miss Alice Aldred, Harrisburgh, Pa	1 00
Miss J. E. Corbett, Rockville, Pa	1 00
J. K. Daniel, Mifflin, Pa	1 00
Miss M. B. Cogley, Lewistown, Pa	1 00
John Reinhart, McVeytown, Pa	1 00
C. B. Moran, McVeytown, Pa	1 00
S. M. Bleakney, Newton, Hamilton, Pa	1 00
Miss A. E. Boyles, Spruce Creek, Pa	1 00
Howard Kirk, Spruce Creek, Pa	1 00
R. H. Hamilton, Tyrone, Pa	1 00
T. J. Gillette, Tyrone, Pa	1 00
Peter Lee, Tyrone, Pa	1 00
C. N. Swoyer, Altoona, Pa	1 00
	$15 00

ADDITIONAL CONTRIBUTIONS.

SECOND DISTRICT—SOUTHERN DIVISION.

J. W. Kates, supt., Lynchburg, Va	$8 00
C. E. McCluer, operator, Lynchburg, Va	1 00
J. E. Simpson, operator, Lynchburg, Va	1 00
C. B. Fleet, operator, Lynchburg, Va	1 00
J. Keller, operator, Lynchburg, Va	1 00
J. F. Norris, operator, Culpepper, Va	1 00
R. W. Cassahan, operator, Pamplin's, Va	1 50
C. H. Whittington, operator, Manassas, Va	1 00
J. C. Duncan, operator, Knoxville, Tenn	1 00
W. O. Duncan, operator, Knoxville, Tenn	1 00
Samuel Reece, operator, Cleveland, Tenn	2 00
G. McKnight, operator, Charleston, Tenn	1 00
O. S. Putnam, operator, Athens, Tenn	1 00
G. G. Stillman, operator, Sweetwater, Tenn	1 00
J. B. Leach, operator, Morristown, Tenn	1 00
H. S. Larcomb, operator, London, Tenn	1 00
J. F. Stone, student, Athens, Tenn	1 00
J. Allison, repairer, Knoxville, Tenn	1 00
M. Darr, repairer, Cleveland, Tenn	1 00
W. H. Thweatt, repairer, Manassas, Tenn	1 00
	$28 00

ALABASTER, MICH.

Dear Sir: Inclosed please find $9 50. I commenced my list while messenger at Saginaw City. Have tried to do all I could for the designed honor to Prof. Morse.

Frank M. Huntington.

A. M. Hilton, Kawkawlin, Mich., manager	$1 00
B. M. Damon, Chesaning, Mich., manager	1 00
B. M. Ross, Laingsburg, Mich., manager	2 00
S. Hunt, Lansing, Mich., operator	1 00
Claude C. Walker, Leslie, Mich., manager	1 00
A. R. L. Covert, Leslie, Mich., agent and operator	50
Miller, Bradley & Co., Saginaw City, Mich., bankers	1 00
F. M. Huntington, Alabaster, Mich., manager	1 00
F. M. Hubbard, Rifle River, Mich., manager	1 00
	$9 50

PACIFIC RAILROAD OF MISSOURI.

St. Louis, Jan. 7, 1871.

Dear Sir: Inclosed please find check for $71, subscribed by the employees in the Telegraph Department of the Pacific Railroad of Missouri, towards the Morse Testimonial.

Very respectively, yours,

K. McKenzie, Supt.

K. McKenzie, supt	$5 00	H. P. Hull, opr	$2 00
James Henry, operator	3 00	E. T. Penolington, opr	1 00
Alf. E. Brown, opr	1 00	McD. Hamlin, opr	1 00
A. Kaemph, opr	1 00	W. Miller, opr	1 00
H. K. Clark, opr	1 00	R. J. Hewitt, opr	1 00
F. B. Deleplane, opr	2 00	E. H. Coffin, opr	1 00
E. H. Woodworth, opr	2 00	M. C. Hamlin, opr	1 00
J. A. Woodworth, opr	1 00	A. G. Carrier, opr	1 00
A. B. Markley, opr	1 00	O. R. Green, opr	1 00
Isaac Diefenderfer, opr	1 00	D. Bytington, opr	1 00
Thomas Naylon, opr	1 00	A. V. Sharp, repairer	1 00
W. N. Payn, opr	2 00	J. M. West, repairer	1 00
W. H. Mageban, opr	1 00	Sol. Palmer, foreman of construction	5 00
Ed. Rogger, opr	1 00	C. D. Griggs, line builder	5 00
G. W. Keen, opr	1 00	H. F. Hune, line builder	1 00
J. C. Ulow, opr	1 00	R. E. Pierce, line builder	1 00
G. W. Thompson, opr	1 00	H. G. Aldrich, line bldr	1 00
E. J. Walsh, opr	1 00	G. Anderson, line bldr	1 00
W. Kane, opr	1 00	S. C. Crawford, line bldr	1 00
E. G. Johnson, opr	1 00	L. Maloney, line bldr	1 00
J. W. Bay, opr	1 00	W. Berkley, line bldr	1 00
J. H. Mellen, opr	1 00	F. W. Campbell, line bldr	1 00
H. W. Lessel, opr	1 00	J. Bylien, line bldr	1 00
M. M. Pritchard, opr	1 00	A. Abbott, line bldr	1 00
J. F. Entricon, opr	1 00	L. Philipp, line bldr	1 00
H. Dennison, opr	1 00	L. Delaney, line bldr	1 00
H. C. Spaulding, opr	1 00		
			$71 00

PAINESVILLE, O.

D. C. Hill, manager, Painesville, O.	$1 00
George T. Childs, messenger, Painesville, O.	50
	$1 50

Read the following and say whether there is any doubt of the balance being received. Give us your bones, Mr. Brewster You will sit next to Mr. Wynkoop.

LARAMIE CITY, WYO. TER.

J. G. Brewster, manager W. U. Tel	$1 00
Mrs. J. G. Brewster	1 00
J. J. Jones, retired operator	1 00
J. F. Fitzpatrick, manager A. & P. office	1 00
H. J. Malone, operator A. & P. office	1 00
D. H. Voorhees, operator A. & P. office	1 00
Millard Fillmore, train-dispatcher U. P. R. R.	1 00
E. Baland, repairer U. P. R. R.	1 00
George Alley, messenger A. & P. office	50
H. J. Rogers & Co., bankers	1 00
Miller & Pfieffer, jewelers	1 00
Laramie Sentinel	50
Shuler & Spindler, hardware	50
C. R. Leroy, hardware	50
Marks, Myers & Co., dry goods	50
Wagner Brothers, dry goods	1 00
Mrs. A. Hatcher, milliner	50
N. C. Worth, dry goods	50
T. D. Abbott, stationery	1 00
E. Ivinson, merchant	50
H. H. Richards, merchant	50
J. B. Finfrock, physician	50
G. G. Spilton, physician	1 00
J. Frank, physician	50
W. M. Crout, Frontier Hotel	50
L. Abraham, New York House	50
W. M. Crawford, Crisman House	1 00
Meldrum & Peck, Central Meat Market	50
Haley & Fox, City Meat Market	50
Harper, agent U. P. R. R.	50
D. L. Sabborty, tonsorial artist	25
William Gale, tonsorial artist	50
M. T. Spicer, carpenter and builder	50
J. A. Pease, city express	50
Col. W. S. Downey, prosecuting attorney	1 00
Brennan & Smith, billiard parlors	1 00
C. Thompson, billiard hall	50
A. Vogelramy, boots an shoose	50
W. G. Town, bookkeeper	01
Mrs. C. Earhart, milk woman	60
	$27 36

Operators, Merchants and citizens of Laramie City, Wyoming, all join in wishing the Morse Testimonial a perfect success, and a happy new year to J. D. Reid. Yours,

J. G. Brewster,
Manager W. U Office.

FROM A WELL-APPOINTED OFFICE.

Flushing, L. I., Jan. 9, 1871.

Dear Sir: Please find inclosed $5, which we send to help in the designed honor to Professor Morse. Yours,

E. F. Cheshire.

E. F. Cheshire, chief manager	$1 00
E. F. Cheshire, day manager	1 00
E. F. Cheshire, night manager	1 00
E. F. Cheshire, ticket agent	1 00
E. F. Cheshire, station master	1 00
	$5 00

If all the men with many offices will follow Mr. Cheshire in sending a dollar for each department, the fund will be complete. Well done, Mr. Cheshire.

A NEW YEAR'S GIFT.

Dear Sir: Inclosed please find $15 75, our New Year's gift to the fund. Yours truly. L. T. Clemans.

L. T. Clemans, manager, Urbana, O.	$1 00
William F. Fox, operator P. C. & St. L. R. R., Ohio	1 00
J. L. Upton, operator P. C. & St. L. R. R., Ohio	1 00
A. L. Carman, operator A. & Gt. W. Ry., Ohio	1 00
J. Adams, agent A. & Gt. W. Ry	1 00
L. S. Purcell, general wood agent P. C. & St. L. R. R.	1 00
Carl White, Esq., Chicago	1 00
J. H. Powell, Esq., Urbana, O.	1 00
W. O. Knight, Esq., Urbana, O.	1 00
A. N. Hurd, agt. & opr. A. & Gt. W. Ry., No. Lewisburgh, O.	1 00
John O. Boner, operator A. & Gt. W. Ry., Marion, O.	1 00
S. A. Orvis, operator A. & Gt. W. Ry., Marion, O.	1 00
L. B. Denis, ex-operator A. & Gt. W. Ry., Newton, O.	50
M. A. Boner, operator A. & Gt. W. Ry., Newton, O.	50
G. W. Holland, operator, Richwood, O.	50
W. Hutchinson, student, No. Lewisburgh, O.	25
M. S. Robinson, agent G. W. D., Urbana, O.	50
Robert Young, boot and shoeist, Urbana, O.	50
J. H. Brown, agent P. C. & St. L. Ry., Urbana, O.	50
Walnut Logs!	25
Every Little Helps!	25
	$15 75

SECOND KICK!

T. C. Hagenbuch, Allentown, Pa	$1 00
T. U. Moyer, Emaus, Pa	1 00
F. S. Hartman, Emaus, Pa	1 00
J. L. Lindell, Emaus, Pa	50
G. F. Exner, Millerstown, Pa	50
J. C. Dunkle, Millerstown, Pa	25
Millerstown Office, Pa	1 00
J. P. Hartman, Alburtis, Pa	50
S. A. Acker, Alburtis, Pa	1 00
E. J. Hirshberger, Alburtis, Pa	50
L. K. Hanoum, Alburtis, Pa	50
W. H. Shantz, Blandon, Pa	50
	$8 75

We show mercy by not kicking too hard.

Yours, T. H. Hagenbuck.

SECOND SUBSCRIPTION.

Binghampton, N. Y., Jan. 10, 1871.

Please accept another small mite in aid of the Morse Monument, making the second subscription from all but the first named. Yours, J. Schnell, Jr.

R. M. Hagaman (a friend), Binghampton, N. Y.	$1 00
A. H. Babb, operator, Binghampton, N. Y.	1 00
Mox Elser, operator, Binghampton, N. Y.	1 00
Morris Brick, operator, Binghampton, N. Y.	1 00
P. Mooney, repairer, Binghampton, N. Y.	1 00
Jas. Schnell, Jr., manager, Binghampton, N. Y.	1 00
	$6 00

GORDONSVILLE, VA.

Here is our mite. Hope we are in time.

H. S. Smithers, operator	$1 00
William M. Yager	50
C. F. Carpenter	50
	$2 00

SUMMIT BRANCH TELEGRAPH, PA.

Dear Sir: Inclosed find $20, from the Summit Branch Telegraph men and their friends. We all wish you success.

Yours, Henry Cordes.

Henry Cordes (2d sub.), Millersburgh, Pa	$1 00
Simon J. Bear, operator, Williamsburg, Pa	1 00
John W. Ditty, operator, Lykens, Pa	1 00
Warren E. Ray, supt. S. B. R. R.	3 00
James Powers, operator, Williamstown, Pa	2 00
E. T. Mutter, ex-operator, Williamstown, Pa	1 00
R. Cobie, operator, Williamstown, Pa	1 00
Jacob Coller, operator, Wiconisco	2 00
A. F. Hanoa, operator, Wiconisco	1 00
John P. M. Haas, operator, Wiconisco	2 00
J. W. Kunkel, operator, Big Lick	1 00
E. H. Wilson, clerk S. B. R. R.	1 00
G. G. Ray, coal shipper, Williamsburg, Pa	1 00
H. H. Musser, B. M. Frank, Charles F. Fisher, E. C. Perchard, J. B. Whitney, J. W. Hoffman, E. W. Ford and George H. Seal, each 25c	2 00
	$20 00

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We see it stated that Mr. Cromwell F. Varley has invented a process by which four distinct currents can be employed in transmission over the same wire.

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MARRIED.

MORRIS—HINDS.—Jan. 12, by Rev. Charles E. Harris, at the house of the bride's parents, Robert H. Morris to Miss Carrie A. Hinds. No cards.

KINNAMAN—ENGLES.—At Embury M. E. Church, Freeport, Illinois, Charley M. Kinnaman, Manager Western Union Telegraph, Tiffin, O., to Miss Zoe Engles, of Freeport, Illinois.

ABERNETHY—LOVELAND.—In Syracuse, N. Y., December 24, 1870, at the residence of the bride's brother-in-law, L. A. Green, by the Rev. C. P. Lyford, J. P. Abernethy, Superintendent Union Telegraph Company, Akron, O., to Carrie B. Loveland, of Syracuse, N. Y.

FOUNTAIN—VAUGHAN.—At the residence of the bride's father, in Scotland Neck, N. C., on 22d Dec., by G. W. Heptinstall, Mr. S. K. Fountain, telegraph operator of W., C. & A. R. R., to Miss Sallie L. Vaughan.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 6,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, JANUARY 16, 1871.

COCK-A-DOODLE-DOO!

It seems as if it were one or more ages ago since our gentle friend, D. H. Craig, announced the dawning of an era of telegraphic disenthralment which would, when the meridian had been reached, leave the ill-used earth with nothing more to hope for or desire. On that glad day Mr. Craig's beautiful home on Peekskill heights would be made to shine with the brightness of seven suns, and at his regal table, where we have often sat a delighted guest, we would, no doubt, have been invited to participate in the banquet, which, by its amplitude and its joy, would typify the gladness of mankind. Alas, the day lingers yet and comes not. Many mails have arrived on which autumn leaves have smiled and winter's snows have frosted, but the note of invitation to the telegraphic feast tarries. So we have to say, "Patience, oh my soul," and silently and anxiously await the coming day.

Meanwhile strange things occur. Mr. Craig announced that among the remedial agencies he was to employ, for the relief of the afflicted American people, was the use of compound wire, an article partly steel and partly copper, whose strength would insure permanence, and whose superior conductivity would make possible a largely accelerated speed in the transmission of despatches. These are great elements of power, admissibly the greatest known to a telegraphic structure. Permanence and capacity in a conductor are perpetual challenges to invention to use the one and rely on the other. So when Mr. Craig came round with his basket of automatic toys, and assured us that his wire could transmit a thousand words per minute, there was really, to appearance at least, one very valuable article in it, and the toot he gave in reference to it was loud and respectable.

In a recently published paper on automatic telegraphy, Mr. Prescott, in alluding to the rate of attainable speed, on different kinds and sizes of wire, states that the maximum number of words transmissible over a No. 8 iron wire is 100 per minute, and over the compound wire, erected by Mr. Craig between New York and Washington, according to data provided by Mr. Craig's electrician, and which Mr. Prescott did not care to examine or dispute, a speed of 250 words per minute had been obtained. This certainly was a very gracious admission. It should have gratified Mr. Craig. Perhaps it did.

But now appears Mr. Moses G. Farmer, the well known electrician, who, in some important respects, reminds us of that gentle and most conscientious and excellent scientist Faraday in the simplicity and entire honesty of his treatment of electrical experiments. Mr. Farmer claims that as the length of the compound wire line between New York and Washington was unduly extended by a necessarily circuitous route, the capacity of that wire should be stated as 312 words per minute over a line of 250 miles, which would have been the length of the line over the ordinary routes. Very well, Mr. Farmer, the argument is just, and you will be allowed your claim. We may as well say that, so far as the argument for automatic transmission is concerned, the question of the rate of possible transit over the wires is, in our judgment, entirely a minor one, so long as the signals sent require translation both before and after transmission. So, Mr. Farmer, your demand, were it doubled, would be granted. Sit down now, for here is a gentleman who evidently wants to speak.

It is Mr. George Little, a pleasant gentleman, a man of long experience, of keen insight, of much reading, a man who, if the truth was known, gave to some English inventors, now noted, the primal ideas on which their fame hangs. Mr. Little is also the inventor of Mr. Craig's automatic instruments. What have you in your basket, my good man? To which Mr. Little replied in the following manner:

"In my basket, sir, is an instrument which may be used on iron wire as well as on the compound. Mr. Prescott is entirely wrong in estimating the conductive capacity of iron wire so low. Mr. Farmer also omits the credit due to the conductivity of a number 8 wire. Absence of mind no doubt caused this strange omission. Why, sir, it is a fact *well known to experts* that *any rate of speed up to two thousand or more words* (or 10,000 letters) *per minute is attainable on an iron wire of that size!* The compound wire is no doubt beautiful. I admire it. It only needs fifteen poles per mile to bear it. It needs less electro-motive force. But, sir, the No. 8 iron wire can send nearly 5,000 messages, of twenty-five words each, per hour! That is the wire the Western Union Telegraph Co. uses. Automatic transmission is, therefore, just as possible to an extent beyond all public necessity, as at present revealed, over their iron wires as over any other. Over the No. 7 wire, recently erected by that Company to Boston, even a larger number of words could be sent. Let the truth be spoken if the heavens fall!

Very well, Mr. Little, be seated. When we hear a word from your friend Mr. Craig, who seems anxious to say something, school will be dismissed. Mr. Craig, we are all ready to hear you. Do not be embarrassed. You are among your friends.

Mr. Craig, rising, and with a mild and pleasant voice spoke as follows: I desire to say—

Firstly. Prof. Farmer and Mr. Prescott are both blind. I know more than they ever forgot, and my experience is better than their theory. Mr. Little and his friends are simply stupid. They don't know anything. Why, sir, the truth is that messages can be sent *easier* on a *long* line than on a *short* one! Wheatstone is an ass. The statement that "speed varies inversely as the square of the length of the line" is arrant nonsense. Cully is a blockhead. Clark "isn't fit to carry guts to a bear." The truth is, "*the longer circuit the better the work!*" Why, sir, *compound wire is of no account!* we can work as *rapidly and as correctly over the poorest Morse wire as over the best compound wire ever made!*

I have also in my hand a letter from the Manager of the British government lines who says that "60 *words per minute is, after a lengthened experience in the working of Wheatstone's automatic machinery, the highest attainable speed of practical telegraphy.*" But this only shows the miserable ignorance of Cully, Clark & Co., into whose visionary hands the English telegraph system has been committed. Over my line 1,000 words per minute is the lowest average I will permit to be named.

At this point we had to interpose. "Really, friends, you must close your baskets and go home. You must all be hungry. A little dinner will do you good. My dear Mr. Craig, be composed. There now, toot a little on your horn, and be a good boy. Exeunt omnes; and as they left an impertinent rooster on an adjoining house said "Cock-a-doodle-doo!"

For particulars see *Scientific American*, Jan. 1, 1871.

◆

Chadwick, Adamson & Co., of London, are said to have brought out the project of another direct cable line between Liverpool and New York. American parties are urged to make up one-fourth of the amount. The announcement that if one-fourth is taken in America, the cable will be laid in July next, is sufficient evidence of its meretricious character. Close inquiry in London assures us that no such work is contemplated at present.

◆

TELEGRAPH OCEAN CABLE BILL.

All communication established, or that may be established between the United States and any foreign country by means of telegraphic or magnetic lines, or cables, laid in any part thereof, in and over the waters, reefs, island-shores, and lands within the jurisdiction of the United States, shall be subject to the following conditions, stipulations, and reservations, to wit:

First: The Government of the United States shall be entitled to exercise and enjoy the same, or similar, privileges with regard to the control and use of any such line or cable, that may, by law, agreement, or otherwise be exercised and enjoyed by any foreign Government whatever.

Second: Citizens of the United States shall enjoy the same privileges as to the payment of rates for the transmission of messages as are enjoyed by the citizens of the most favored nations.

Third: The transmission of dispatches shall be made in the following order: First, the dispatches of State, under such regulations as may be agreed upon by the Governments interested. Second, dispatches on telegraph service. Third, private dispatches.

Fourth: The lines of any such cables shall be kept open to the public for the daily transmission of market and commercial reports and intelligence, and messages, dispatches, and communications shall be forwarded in the order in which they are received, except as hereinbefore provided.

Fifth: Before extending or establishing such line or cable in or over any waters, reefs, islands, shores, and lands, within the jurisdiction of the United States, a written acceptance of the terms and conditions imposed by this act, shall be filed in the office of the Secretary of State by the company, corporation, or party proposing to establish telegraphic communication.

SEC. 2. *And be it further enacted*, That, subject to the foregoing conditions, stipulations, and reservations, and subject to such grants as have heretofore been made by Congress to lay and maintain telegraphic cables from the shores of the United States, the consent of Congress is hereby given to the laying and maintaining of telegraphic or magnetic lines, or cables, between the United States and foreign countries, in and over the waters, reefs, islands, shores, and lands, within jurisdiction of the United States.

SEC. 3. *And be it further enacted*, That, any person connected with any company engaged in the tramission of news to foreign countries who shall, contrary to his duty, disclose or in any way make known or intercept the contents of any message, or any part thereof, and any person who shall injure or destroy any cable or other property of the company, or interfere with the working, repair, or use of any cable or line connected with such cables, shall, upon conviction thereof, be subject to a fine not exceeding $5,000 or to imprisonment for a term not exceeding three years, and the party injured thereby shall have a right of action for damages. It shall be the duty of the Attorney-General to prosecute all persons offending against any of the provisions of this act in any District Court of the United States.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
January 6th, 1871.

Executive Order No. 115.

Great embarrassment is sometimes occasioned by the failure on the part of Superintendents and Managers, to promptly otify the Executive Office of the service of legal process on them instituting legal proceedings against the Company.

It is, therefore, ordered that immediately upon the service of any legal process, or papers, for the commencement of any action, or legal proceedings, against the Company, the person upon whom such service is made report the fact promptly, by telegraph, to the Treasurer, at New York, stating briefly the nature of the process and when served, and transmit to him, by the first mail, a copy or abstract of such paper, or process, so served upon him, with a statement of such facts relating to the subject matter of the proceeding as are within his knowledge. He will retain the original paper, subject to instructions from the President or Treasurer.

The General Superintendents of the respective Divisions are charged with the due execution of this order.

WILLIAM ORTON, President.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
January 14, 1871.

Executive Order No. 116.

Gen. Marshall Lefferts having resigned the office of Engineer of this Company, the duties heretofore performed by him will hereafter, and until further orders, be devolved upon George B. Prescott, Electrician. The office of Engineer is hereby abolished.

By order of the Executive Committee.

WILLIAM ORTON, President.

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RESIGNATION OF GEN. LEFFERTS.

ENGINEER'S OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
NEW YORK, January 5, 1871.

HON. WILLIAM ORTON, *President.*

DEAR SIR :—I respectfully place in your hands my resignation as Engineer of this Company, to take effect at such time as may be most agreeable to yourself. I beg to express my deep regret as I thus close a long and pleasant service, and to thank you personally for the cordiality of our intercourse, which, I trust, will be extended to the position which I shall hereafter occupy as President of the Gold and Stock Telegraph Company.

Very respectfully, MARSHALL LEFFERTS.

MR. ORTON'S REPLY.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
NEW YORK, January 6, 1871.

GEN. MARSHALL LEFFERTS, *Engineer, &c.*

MY DEAR SIR:—I beg to acknowledge receipt of yours of 5th instant, tendering your resignation as Engineer of this Company, to take effect at such time as will be most agreeable to myself.

In reply thereto, I have to say, that the resignation is accepted, and I indicate Saturday, the 14th instant, at the close of business, as the time most convenient and most conducive to the interest of the Company, when it shall take effect.

I avail of this opportunity to express my regrets that other business relations, on your part, should have rendered necessary the severance of those which you have so long sustained to this Company. Before concluding, I beg to acknowledge the uniform courtesy which has marked, on your part, all our personal and official intercourse, and to wish you abundant prosperity in all your future undertakings.

Believe me, dear sir,
Very truly yours,
WILLIAM ORTON, President.

◆

A GIFT NOT REFUSED.—Mr. A. S. Brown, the worthy Manager of the operating department of the W. U. T., at 145 Broadway, New York, was presented by his amiable partner, on the evening of December 23d, with a fine daughter. According to our latest advices, Mr. Brown has not declined this testimonial of Mrs. Brown's esteem.

◆

MR. DOREN, Superintendent of Construction, Eastern District, has within the past six weeks erected a No. 7 galvanized wire, of superior quality, between New York and Boston; and in six days a similar wire between Springfield, Mass., and Boston.

BASE FOR THE STATUE OF PROF. MORSE.

THE exact cost of the granite base to bear the Morse statue in New York Central Park will be $1,100, and has been contracted to be executed for that amount. The foundation was finished January 9th. It rests upon solid rock, and is located on the crown land, near the Casino, on the Fifth Avenue drive. O. T. Rogers & Co., of Boston, Mass., provide the granite from the Quincy quarries, deliverable in New York March 15th, ready for placing. The base will be of a form to admit of bas-reliefs of men distinguished in American telegraphs, such as Hon. Amos Kendall, Hon. Ezra Cornell, or such as the contributors may hereafter select. We would be glad to see ample honor done to every man who has helped to bring this great invention to life. Properly viewed, the honor to Prof. Morse includes all who aided him, and represents also the poverty, and cares, and toils which many, ourselves included, suffered at its birth.

We have invited twenty-two gentlemen to unite in providing the granite base, and the following is the list of remittances up to date :

George W. Childs, Esq., Philadelphia	$50 00
Wm. Cullen Bryant, New York	50 00
Governor Rufus B. Bullock, of Georgia	50 00
Clarence Rathbone, Esq., of Albany, N. Y.	50 00
Hugh Allan, Esq., President Montreal Telegraph Co.	50 00
Andrew Carnegie, Esq., Pres. Union Iron Works, Pittsb'g	50 00
Gen. Anson Stager, Gen'l Supt., Chicago, Ill.	50 00
Byron M. Pickett, Esq., sculptor, New York	50 00
Hon. William Kelly, Rhinebeck, N. Y.	50 00
Ex-Governor Marshall Jewell, Hartford, Conn.	50 00
Lewis Roberts, Esq., New York	50 00

We invite those who comprehend the value of the telegraph to science, to commerce, and to society, to contribute the residue of the above fund. Address

◆

THE TELEGRAPHERS CHECKMATED—HONORS DECLINED.

It has leaked out that a movement was recently inaugurated, and conducted in private, by the telegraphers of the Western Union Company in this city, for the purpose of having something tendered by way of a holiday present, in token of their respect and esteem to their worthy chief, David Flanery, Esq.

The present agreed upon was a gold watch and chain, with seal, jewels, and graven device expressive of some of the leading features of the profession.

The watch, one of Tyler's best, was being negotiated for, the champagne about to be ordered, and all of the appointments on the eve of being made, when, to the great regret of the promoters of the scheme, a circumstance took place which brought the whole business to a speedy stand-still. It was this : Another movement of a like nature and for a similar purpose, originating with and confined to the country operators of the Twelfth District, having been discovered at the eleventh hour by Mr. Flanery himself, the intended recipient of the honors, called forth that gentleman's emphatic condemnation of the proceeding, together with a prompt and imperative order to the effect that the matter be dropped, then and there, at once and forever; and that no proposition of the kind be, at any future time, either entertained or acted upon by any person or persons receiving orders from or through him.

This was a stunner. No further action was had in either camp. The boys growled over somebody's imprudence and resumed their respective duties.

During the twenty years, or more, that Mr. Flannery has been at the head of the telegraph—the very life of the system—hereabouts, he has invariably declined—peremptorily refusing when urged—to accept or receive any testimonial whatever at the expense of persons subordinated to him in office.

We avail ourselves of this opportunity to say that Mr. Flanery is an electrician of clear notions and a practical tendency, an officer of ability and integrity, and a gentleman of fine mental and moral qualities. Early and late he is seen at his post, doing, directing, devising; affording instruction and procuring employment for aspirants of both sexes; true to every trust, faithful to every promise, mindful of everything, forgetful, apparently, of nothing but self.

To the electrical fluid—the speaking spark—Mr. Flanery has given conduct, safe and swift, over bayou, brake and prairie; through marsh and trackless forest; by road and riverside, and along subaqueous ways, until marks of his enterprise are everywhere seen, and man is made to marvel at, and profit by the genius of Morse; and the winds themselves are made to harmonize with the music of dot and dash, singing Æolian praises to that great man's name—*from pole to pole.—From the N. O. Times.*

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
January 15, 1871.

To all Offices on W. U. Lines :

The following changes in tariff have occurred since Jan. 1st, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

307 Belknap, Iowa.
Chapman's Creek, Ks., tariff 75 cents more than Lawrence, Ks.
109 Freeburg, Ill.
357 Gilson, Ill.
261 Jamestown, Ind.
257 Maquon, Ill.
226 Meriden, Ill.
170 Melvern, O.
Monument, Ks., tariff 155 more than Lawrence, Ks.
66 Minersville, Pa., heretofore an other line office.
475 New Chicago, Ks.
36 No. Pownal, Vt., reopened.
156 Orangeburg, S.C., reopened
368 Paloma, Ill.
457 Pawnee, Ks.
41 Port Johnson, N. J.
140 Stand Off City, Pa.
140 Siverlyville, Pa.
246 Sabula, Iowa.

OFFICES CLOSED.

Divide, Ks.; Jacksonville, Ala.; Loachapoka, Ala.; Pleasant Valley, Idaho; Point-du-Chene, N. B.; Penfield, O., and York, O.

GENERAL INFORMATION.

Hereafter the "tariff for other lines," from Elyria, O., will be as follows

To Litchfield, O., 40 and 3.
Medina, O., 45 and 3.
Middleburg, O., 50 and 4.

Business for Baker's Pt., N. Y., leaves this line same point as business for Black Brook, N. Y.

For Plessis and Rensselaer Falls, N. Y., same as business for Richville, N. Y.

For Starkwater and Milan, N. H., (incorrectly given in last JOURNAL, Milan, N. Y.), same as business for Bethel, Me.

"New Platz, N. Y.," in last JOURNAL, should read "New Paltz, N. Y.," and "Treeville, N. Y.," in same JOURNAL, should read "Freeville, N. Y."

Hereafter the "tariff for other lines" to Montgomery and Campbell Hall, N. Y., will be 40 from New York, 50 from Binghampton, and 70 from Buffalo and Salamanca, N. Y. To New Paltz, Gardiner, Shawangunk and Walden, N. Y., 40 from New York, and same rate as Goshen, N. Y., from Buffalo, Binghamton, and Salamanca. The point where business "leaves this line" will be same as that for business from Goshen, N. Y.

OFFICES HAVING "SPECIAL SHEET A,"

Will check Minersville, Pa., 15 cents more than special rate to Philadelphia.

ATLANTIC CABLE BUSINESS.

In table of increased Continental Rates, in Tariff Circular of January 1, 1871, insert $1 75 for "Ordinary Continental Rate" for 20 words from London to Spain.

Messages may be taken, at sender's risk, for Paris, to go per "Pigeon Post." An extra charge of ten cents per word must be made, and messages must not exceed twenty words.

The line to the Island of Java is completed and open for business. Following are rates:

From London	*For 20 words.*
To Penang	$26 75
To Singapore	30 75
To Java, Batavia, and Welter Vreden	36 25
To Java, (West of Samarang)	36 50
To Java, (East of Samarang)	37 00

Half rate for each additional ten words or fraction thereof.

INCREASE OF RATES TO INDIA AND CHINA.

We are advised of following increased rates to take effect at once:

From London to	10 words	20 words.
India	$15 00	$20 00
Ceylon, Farther India and China.	16 00	21 00

Charge one-half the twenty word rate for every additional ten or faction of ten words beyond twenty.

Postage from any point 37 cents extra.

Messages for China may be sent "Post Singapore," by paying the Singapore tariff, plus 37 cents for postage.

WILLIAM ORTON, President,

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

ASSESSMENTS RECEIVED, No. 16.

W. A. Weller.
H. H. Abrams.
J. H. Pressley.
J. P. Bogar.
R. M. Early.
W. A. Tinker.
W. Holmes.
C. W. Moore.
B. A. Pryor, 15 and 16.
N. Trissell.
J. B. Collins, 15 and 16.
F. H. Jordan, 15 and 16.
C. H. Summers.
J. V. Ford.
R. B. Woolsey.
Day. K. Smith.
Jay J. Hoke, 14, 15, 16.
G. W. Anderson, 15, 16.
M. Foley.

ASSESSMENT No. 17.

6	64	122	213	282	372	477	630	730	839	936
8	65	127	215	283	374	517	645	731	848	943
13	71	129	218	285	376	520	659	762	856	953
19	74	131	231	289	379	547	670	763	873	963
22	77	136	237	302	380	550	678	774	874	969
25	78	139	246	322	386	564	679	777	904	975
26	83	143	248	327	388	585	680	779	911	981
29	86	175	256	328	389	594	690	795	912	1011
31	88	179	274	330	397	597	702	807	914	
33	91	180	276	344	435	608	706	817	917	
41	99	197	278	349	437	617	708	819	923	
54	116	206	280	352	440	619	721	832	932	
56	117	212	281	371						

ASSESSMENT No. 18.

Nos. of Certificates of those who have Paid.

4	64	126	230	328	420	564	697	786	880	1001
5	66	131	231	330	426	566	700	790	900	1002
6	67	133	237	332	431	569	703	791	901	1005
7	69	134	243	344	438	577	711	795	902	1006
12	71	136	244	351	463	584	716	797	907	1007
13	72	138	254	352	464	585	720	800	910	1009
16	77	139	257	353	469	587	721	802	915	1010
17	78	157	269	367	476	594	722	803	917	1011
18	80	163	274	371	478	603	729	806	930	1012
19	82	175	276	373	509	616	740	807	931	1016
23	83	181	277	376	510	618	741	809	938	1019
26	86	185	286	378	517	619	742	815	939	1020
30	90	186	288	381	536	623	765	818	944	1028
35	93	187	291	383	546	625	772	821	946	1029
40	96	189	292	389	547	632	773	830	947	1036
41	98	190	301	390	548	635	774	836	952	1039
42	99	191	302	391	549	646	776	837	953	1040
46	103	193	306	392	552	648	777	838	961	
49	105	199	309	393	553	670	778	839	969	
52	108	200	312	396	555	672	781	840	980	
53	111	208	316	397	556	685	782	841	986	
54	113	213	319	405	557	686	783	844	994	
56	117	216	323	406	560	690	784	874	996	
61	122	217	327	411	563	695	785	878	1000	

◆

WE DESIRE all who make application for admission to the association to be particular in stating in whose favor the insurance is made. In settling the insurance of Mr. Janes, of Evergreen, Ala., the following difficulty occurred: Mr. Janes insured in favor of Mrs. William P. Janes. In June last, or thereabouts, Mrs. Janes died. On September 28th Mr. Janes was again married. An hour or two after the ceremony he was taken ill, and died on the following Sunday. He left three children by his first wife, for whom parties claimed the insurance money. We had to claim that Mrs. William P. Janes, the second wife, was the rightful heir, and finally paid it to an administrator appointed by the court. Had the first wife's maiden name been given, instead of his own, the children could have claimed the money. Now it rests with the second wife to say whether they will receive any part of it. Our duty, however, was clear. There should be great precision in arranging such affairs, and we desire the thoughtful consideration of all members to the matter.

ANSWERS TO CORRESPONDENTS.

This was left out of its proper place in the paper until too late to notice the omission.

Will you please inform me what is the amount of resistance in ohms for each foot of plumbago, such as used in the lead pencils furnished by the W. U. Tel. Co.? Also, is there no better or cheaper way of establishing a uniform resistance in circuits without using the coils of fine iron wire?

I have been using water for some time, but the tension is too variable to make the lines work satisfactorily.

The resistance of plumbago varies according to quality; that contained in the "Star" pencil measured 59 ohms, and that in the "Grossberger and Kurz" has 69 ohms.

Resistance coils, or rheostats, are generally made of German silver, which has twice the resistance of iron; but a cheap and serviceable rheostat may be made by covering a wooden stick with varnish, and, while still wet, putting on a coating of pulverized plumbago, and then covering this again with varnish.

◆

WE HAVE before us an instrument constructed for telegraph learners, which is designed to supersede the necessity of a battery, the stroke, of the armature of the magnet, being accomplished by mechanical means. It is manufactured by Messrs. D. W. Putt & Co., Wellsville, O.; cost $7.

It is very simple. An ordinary telegraph key is planted on a shallow box and is made so as to have a shaft extend from the arm where the anvil usually is attached into the box below. Here it operates on a lever, which moves mechanically an arm, the motion and form of which is exactly the same as the arm of a regular magnetic sounder. It conveys to the eye and ear the sounds and motion familiar when working a telegraph line, and thus is all to the learner that a magnetic circuit can be except in distance, the sounder and key being necessarily contiguous, and adapted to a single learner, or to two learning at the same table and alternating the processes of receiving and sending. It is very cheap, and, so far as learning by sound is concerned, useful and ingenious.

◆

CANADIAN TELEGRAPHY.—Canada has now 2,000 miles of telegraphic wire, and the number of her telegraphic offices is 675. The wires are carried on cedar poles, 25 feet to 30 feet high; these are placed 10 rods apart, or 32 to the mile, and it is rare to find one out of the perpendicular. No. 9 English galvanized wire is almost universally employed. The Grove battery is employed on all main circuits, except for unimportant branch lines. The Montreal Telegraph Company has paid an annual dividend of 10 per cent. upon a capital of $750,000. The expense of repairing Canadian telegraphs is stated to have been greatly lessened by the substantial construction of the lines. It is expected that before many years have elapsed, a cable line will be laid through Lakes Huron and Superior, connecting with a land line to Red River, and across the plains of the Saskatchewan. —*Engineering.*

◆

THE SOUL AND GOD.—As the reader of the trans-Atlantic message, sitting in his office at Heart's Content, gazes into the illuminated mirror of his delicate apparatus and sees the shadow of the slender steel bar sway once and again, obedient to the invisible currents, and knows that the touch of far off hands is revealed in every motion, and so reads the certain tidings of events and records of affection from beyond the sea—so the pure and seeking soul in the secure place of its faith—the citadel of its "heart's content"—and in the clearness of its sincere depths, sees the index of conscience point to duty, the steady sway of reason to the right indicate truth, the tremulous stir of moral affection spell out the messages of the everlasting love—all made magnetic and responsive by unseen currents wafted from the very being of God, through the dispensing influence of the Holy Spirit.—*Rev. H. H. Barber.*

BAD WRITING.

CRAWFORD CO., PENN., January 2, 1871.

J. D. REID, Esq., Ed. of the Journal of the Telegraph.

DEAR SIR:—Having seen in a late issue of your paper an article entitled "Two Prominent Evils," I am constrained to write you a word in regard to the latter evil: that of so much *ridiculously* obscure manipulation upon our wires.

Perhaps no one obstacle to the rapidity of telegraphic business is greater than so-called *fast* and imperfect writing upon the key. It is no object to the receiver to have words sent him faster than he can comfortably copy them in a legible manner, be they never so perfectly written.

Too many of our operators strive to *push* the business through, regardless of *how* they do it; and, as a consequence, the receiver "breaks" quite too *often*, and the sender, rather provoked, manipulates worse than before; and so a confused copy probably results in errors, besides occupying one-half more time than to have done it well at first. What availeth it to do business in this manner?

There is a proper way to use a telegraph key in all cases, from press reports to train reports; and it is this: strike your letters *quickly* and firm, with *never* a dot too many, or one too few—space *perceptibly* between them, and close each word with a still longer space. *Running the letters together* is the evil of evils.

Telegraphic letters cannot be made too quickly for the ear, but they *can* be run together and confused.

Having had not a little experience in teaching the art of operating the telegraph, I know whereof I speak, and I agree with you that in the rudiments no learner should make the letters without a register in his short circuit beside the key, to record his work.

I would say to those learning to use the key, practice making combinations of like letters and figures in quick succession, such as n-d-b-8—a-u-v-4, &c.; it is a splendid exercise. You will find a nicely arranged course of lessons of this nature in "Wood's Plan of Telegraphic Instruction;" I presume it may be obtained of the author, Otis E. Wood, Etna, N. Y., one of the oldest and finest operators in the land.

One young man, entirely ignorant of telegraphy, after being under my instruction thirty days in the above manner, manipulated well, and copied by sound, without "breaking," twenty-five average words per minute.

If the greater part of our operators would take into consideration this *Prominent* Evil, and refrain therefrom, there would be, at once, a great reform in the celerity of telegraphic communication; and all wires would be operated as is one of which I know, without a "*break*," and no response from the receiver but his "signal letter." A far greater amount of business would be done in the same time, and more perfect transmission over long circuits insured

Yours, telegraphically, H. C. B.

◆

TELEGRAPHY IN WESTERN AUSTRALIA.—A Magnetic Telegraph Company has been successfully floated in Western Australia, the shares applied for having been allotted. The first section constructed will extend from Perth to Bunbury, and thence to Albany, a distance of 260 miles.—*Engineering.*

◆

AS BEST AMALGAM for electrical machines, Boettger recommends a mixture of two parts by weight of pure zinc, while melted, to be mixed with one part of mercury. This should be kept in pieces in a well-stoppered flask, and is said to be superior to the amalgam made of two mercury, one zinc, and one tin.—*Dingler's Journal.*

PRESIDENT ADAMS' OPINION OF PROF. MORSE.

The following is a copy of a letter from the Rev. R. R. Gurley to Prof. Morse, dated New York, 30th June, 1845.

> MY DEAR SIR: It may gratify you to know that in a recent conversation with Mr. John Quincy Adams, he took occasion (in some observations on the office of President of the United States), to remark, in effect, that political life was by no means the exclusive nor, indeed, the most sure path to honor and usefulness; that higher distinction than could be conferred by any office could be won in the field of Science and Philosophy, adding, "*Why, FULTON and MORSE have done more, by their discoveries, for their country and the human race, than any two hundred Presidents in succession could be expected to accomplish.*"
>
> With great respect, my dear sir,
> Your friend and servant,
> R. R. GURLEY.
>
> Professor Morse

◆

SCIENTIFIC men suspect the existence of a connection between the working of electro-magnetic forces on the earth and the spots on the sun. The supposition is upheld by a chain of circumstantial evidence of considerable strength. There seem to be recurring periods in which the spots are extraordinarily numerous. There seem to be recurring periods in which the magnetic forces of the earth are extraordinarily active and auroras are remarkably abundant and brilliant. The two periods correspond in terms of from ten to eleven years each. The sun-spots of 1869 were never exceded for number, and there were auroras nearly all the time. In 1859 there were likewise many sun-spots and many auroras. On the 1st of September of that year, two English astronomers looking at the sun observed great and sudden commotions among the spots and intensely bright patches of light flashing in the midst of them. At the same instant a tremendous magnetic storm began all over the earth. It was marked by the interruption of telegraphic lines and by other signs, in England, in Norway, in Australia, in the United States, in the West Indies, in South America. At night, every part of the world where the aurora is ever seen was illuminated by it in the most magnificent style.

◆

NATIONAL MONUMENT PROPOSED BY DR. STONE, SCULPTOR, N. Y., TO BE ERECTED AT WASHINGTON, D. C., IN HONOR OF PROF. S. F. B. MORSE.—The design of this work consists of a colossal statue of Professor Morse, nine feet in height, surmounting an appropriate shaft and base, seventeen feet high, enriched with numerous sculptures illustrating the various phases of the invention. In the cornice are wrought the busts of the eminent men who have aided in extending the uses of the telegraph. In the freize are represented the capitols and other characteristic specimens of the architecture of Europe, Asia, Africa and America, over which are suspended the telegraphic wires. The entire plane of the cylindrical shaft of the base below the freize is surrounded by groups of figures, in high relief, representing the American inventions for speeding the material and intellectual commerce of the world, the series culminating in the electric telegraph. Surrounding the base are four pedestals, surmounted by life-size statues personating the four quarters of the globe. The panels of the base are filled with appropriate symbols, in low relief—the one below the front of the chief statue containing the forms of the artist's palette and brushes, the electrical machine and the galvanic battery, grouped together. The entire work, with the exception of the lower base and pedestals, will be wrought in bronze, and will cost nearly $100,000.

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WINDOW TUBES, BATTERY BRUSHES,
SYRINGES, FUNNELS, HYDROMETERS,
ACIDS AND CHEMICALS FOR BATTERIES,

KERITE WIRE,
BRAIDED AND WOUND OFFICE WIRE,
GUTTA PERCHA OFFICE WIRE,
SWITCH CORD,
CALLAUD BATTERY,
DANIELL BATTERY,
GROVE BATTERY,
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LECLANCHE BATTERY,
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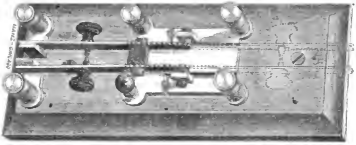

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For full description and testimonial see JOURNAL, Dec. 15, 1870. Liberal terms and arrangements will be made with the trade, telegraph companies and contractors. Sample keys now ready.

JOS. J. B. FREY,
Inventor and Patentee.

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We are now making and keep on hand a style of

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and operators, and for use on telegraph lines, having a range from a small fraction of

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to measure either instruments, lines or insulation with equal convenience.

2. It is made on the

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principle, which is the most

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method of measuring resistances, involving less liability to error than any other.

By this plan it is the resistance itself which is

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and not some other thing from which the resistance has to be computed by a series of caculations. Its use is therefore

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in a few minutes time.

3. It is

LIGHT AND PORTABLE,

the whole being contained in a small box which a man can easily take in one hand like a valise.

By our arrangement of connections and resistance coils a great range of measurements is obtained without the usual drawback of a cumbersome and heavy box.

4. To bring the instrument into general use we put the price at the low figure of $100, with $10 extra for an outside case and set of flexible cord connections.

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METEOROLOGICAL PHENOMENA.

The Meteorological Committee, appointed at the request of the Chief Signal Officer of the Army of the United States, by the Nashville Board of Trade, composed of Judge James Whitworth, R. T. Kirkpatrick, Dr. W. W. Berry, M. S. Cockrill, and E. D. Hicks, held a meeting a few days since, and heard the remarks of Mr. W. D. Gentry, Secretary of the Nashville Board of Trade, on the subject of meteorological observations. Mr. Gentry said:

"While in Cincinnati, at the office of the Western Union Telegraph, I had at my command all the circuits of the Western Union Telegraph Company concentrating in Cincinnati, from every direction. Cincinnati is a central point in the telegraph system of the country, and I could communicate directly with many points in the South; also with Washington, Baltimore, New York, Buffalo, Cleveland, Chicago, and all points west to St. Louis. While so situated, my attention was called to the fact that the approach of a storm in the direction of Cincinnati could be accurately traced, and the hour indicated with great certainty when it would pass a given point. All storms come from the west during the greater portion of the year; there being only about four months in the year that storms do not originate and come from that direction.

In the summer months storms are not general in their character. They originate anywhere, and only extend over a small portion of country, sometimes twenty-five miles and sometimes fifty and one hundred miles. As the distances over which storms pass during the summer mouths, I noticed that a storm coming up during the months from October to May at St. Louis, at eight o'clock in the evening, would reach Cincinnati at two or three o'clock in the morning, and that there is no difference in the rapidity of snow and rain storms After long seasons of rain or cloudy weather I noticed that clear weather would come in the same way. Commencing at St. Louis, the clouds would gradually disappear, and the wave of light spread towards the east. I found that not only storms during eight months of the year come from the west, but that the general course and extent of territory from north to south indicated that there does exist meteorological divisions, and over which these storms passed, of which there are three—one north of a line running from the northwest through Chicago, Cleveland, Reading, Pennsylvania, Trenton, New Jersey, and converging at a point in the ocean southeast of Philadelphia. This we will call the Northern Meteorological Division. Another division, extending north as far as the line just indicated, and south along a line running from the west through a point between Cairo and Memphis to Bowling Green, Kentucky, Petersburg, Virginia, Cape Charles or Fortress Monroe, to a point in the ocean east of Albemarle Sound. The third, or southern division, makes the line just described its northern boundary, and, I presume, extends as far south, in this longitude, as Decatur, Alabama.

I have observed the difference many times between the weather in the different meteorological divisions. I observed to-day that in the middle division the weather is cold and cloudy. It has been snowing nearly all day (now three o'clock). The cars coming from Louisville had snow on them this morning; and we learn that the cold rain and snow extend as far south as Bowling Green. Here, and as far north as Franklin, Kentucky, we have beautiful bright weather, the sun is shining, and is not cold. While in New York, working the wires to Washington, I have repeatedly noticed like occurrences. The snow or rain-storm at New York would extend no farther south than about Trenton, N. J., and, while clear in New York and as far south as Trenton, the weather would be wet and stormy at Philadelphia, Baltimore, and Washington. These observations have clearly proven to me the existence of the meteorological divisions described to you: while I believe that, if competent persons are placed at central points to observe, the exact boundary lines will be located more accurately than I have been able to do with my limited time and opportunity.

I have observed that the most disastrous tornadoes or wind-storms occur on either side, within seventy-five miles of the line separating the middle from the Southern Meteorological Division. These tornadoes are generally local, in width from one half to two and a half miles, and passing frequently over not more than twelve miles of country. They frequently occur in the neighborhood of the line, and sweep down houses, barns, fences, trees, and everything else in the way, often killing or crippling every living thing in the way. You remember the great disaster at Cave City, Kentucky, caused by one of these storms last season. In traveling through Southern Kentucky you frequently see the pathway of these dangerous wind-storms through the forests, with the trees torn up by the roots, and laid as flat as the axe of the woodman could lay them. I have also observed that directly after a general storm of rain, snow, or wind, in either the Middle or Southern Division, that the reports from steamers passing east of our coast, published in New York, Charleston, or Savannah papers, would contain accounts of storms off Cape Hatteras, and as the storms in all the divisions seem to converge at a point east of Cape Hatteras, I have concluded that the great and continual commotion of the wind and water off Cape Hatteras is caused by the currents of air from each meteorological division converging there. A telegraph operator, with ordinary perceptive faculties, can, by working a wire, detect the presence or absence of atmospheric electricity, and, with proper instruments, can measure the amount of that electricity in the air.

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JOURNAL OF THE TELEGRAPH.

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[From the London Chemical News.]

ELECTRO-MOTIVE FORCE.

By the Rev. H. Highton, M.A.

The subject of electro-motive force is so important, and the prevalent idea that only a definite amount of work can be got out of a definite amount of chemical changes, has so completely blocked the way against a true consideration of the subject, that I think it may be useful if I make a few remarks on the nature of this force.

Let me first contrast it with the force of attraction of gravitation.

There is, then, *first*—this wonderful difference: that the force of gravitation between two bodies varies inversely as the square of the distance between them, whereas electro-motive force is equal at all distances. The electro-motive force, developed between a plate of zinc and one of copper, one-tenth of an inch apart, is exactly the same, neither more nor less, than if one is in America and the other in England; and if one were on the earth and the other in the sun, or in the most distant fixed star, there is no reason to suppose it would be any less. This is a fact which will, of course, be acknowledged by every electrician, but I may as well say that I have tried a plate of zinc, placed at ten miles distance from a plate of copper, and found the electro-motive force exactly the same as when they are one-tenth of an inch apart. If we could cut the earth into two hemispheres by an insulating plate, we could transmit any amount of force, or any telegraph message, from any point in one hemisphere to any point of the other, without the slightest difficulty. The resistance in that case would be next to *nil;* and as the magnetic and chemical forces transmitted by a circuit are only limited by the resistance of the circuit, almost any amount of power could be transmitted. As we cannot thus cut the earth in two by an insulating plate, we are obliged, in transmitting magnetic or other power from England to America, to use the sphere of the earth for one-half of the circuit and an insulated wire for the other half; and it is the resistance of this wire which limits the amount of force transmitted. Similarly, on the supposition of being able to form a circuit by cutting into two insulated hemispheres the sphere of stellar space, we could transmit any amount of magnetic force to the furthest star. Nor is this case wholly an imaginary one. As a matter of fact, we have in nature an instance of two enormous conductors with an insulating band between them. There is the earth and sea, which form one conductor; and at a certain distance from them there is a second conductor, consisting of the upper and rarefied strata of the atmosphere, with an insulating band of denser air between them. Now when, from unknown causes, the electric equilibrium between a pole and the zenith is disturbed, a current passes from the zenith to the pole through these rarer strata of the air, and a corresponding current passes through the earth and sea in an opposite direction. This, of course, is the well-known phenomenon of aurora with its corresponding earth currents which are so annoying in the electric telegraph. Whether the circuit is completed through vertical strata of the atmosphere at the equator and the pole, rendered conducting by vapors or other means, or whether there are simply two electric discharges from the zenith to the pole, one in the upper regions of the air, the other in the earth and sea, acting inductively on one another, we cannot be sure. It may be right to add that in reality the force of gravity is the same at all distances; but inasmuch as it is a force radiating from a centre, the portion which acts on any given surface varies inversely as the square of the distance, because the whole force extends itself over a space varying as the square of the distance, and, therefore, a given surface receives so much less of it at a greater distance; but the force itself is equal at all distances.

Secondly.—There is this important difference between gravity and electro-motive force: that the one acts only in straight lines, whereas the other appears to be wholly indifferent how tortuous its course may be. Provided only there are two channels of communication between two metals, one forming a liquid communication and the other a metallic or gaseous conductor, the straightness of the two channels makes very little difference.

Now observe the enormous practical importance of this point. Suppose we want to avail ourselves of the force of gravity as a motive power to do work. The work produced is, as the mass on which it acts, multiplied by the space (or square of the time) through which it acts. Thus, if we use it to move clockwork, and want it to make the clock go for a very long time, we must raise a given weight to a proportionate height; and the more power we want to get from it the higher we must raise the weight in the first instance. Then the force of gravity, acting through a longer space and longer time, will produce so much more work; and the work done is in proportion to the perpendicular height to which the weight is raised, measured in a straight line. But if we want to increase the work we can get out of the electro-motive force of a pound of zinc, and for this purpose increase the time and space through which it acts, we may place it as near as we like to a plate of copper (indeed, the nearer the better), and increase the space and time through which the electro-motive force acts by convoluting in any way the wire which connects the two metals. In this way, by increasing the length of the conductor, and so increasing the space and time through which the electro-motive force acts, we can increase, to any extent, the work obtained. And it is in this way, and owing to this peculiar property of electro-motive force, that we can get any amount of work whatever, even from a single grain of zinc. It is strange, but it is true. Scientific men have hitherto (generally, though by no means universally,) failed in recognizing this wonderful fact, in consequence of that most fallacious idea of a definite mechanical equivalent of heat. It is surprising how it has grown into a common axiom with scarcely the slightest foundation in fact. Not a few scientific men have asserted, more or less directly, that the power to be got from electro-motive force is without limit; but of late years they seem to have been driven out of their position by the assumption of a definite mechanical equivalent for heat and chemical change. I have entered more fully into this question in the January number of the *Quarterly Journal of Science*, but let me here give a single fact which wholly overthrows the supposed action, at least in a practical point of view.

Take three cylinders and pistons, one filled with atmospheric air, another with vapor of water (or steam), and the third with vapor of turpentine. Impart to each a definite number of heat-units or calorics. This amount of heat will produce, say, one unit of work, or will raise an unit of weight one unit of height by means of the third cylinder and piston; but in the first cylinder and piston it will raise the same weight ten times as high, and in the second 6.6 times the same height Of course it is easy to answer that in the one case it has also expanded vapor of turpentine, whereas in the other cases it has only expanded steam or air, and that this is to be considered as work. But the answer is simple; that if this be work, it is not work in the ordinary and practical acceptation of the term, namely, units of weight raised units of height.

I will show at another time how the work done by a given quantity of heat may be increased indefinitely.

Putney, December 18, 1870.

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LIGHTNING AND TELEGRAPH WIRES.

On the Mode of Action of Lightning on Telegraphs, and on a New Method of Constructing Telegraph Coils.[*]

By S. Alfred Varley, Assoc. Inst. C. E.

In the early days of practical electric telegraphy, lightning protectors to protect the coil wires were adopted in telegraph offices.

The general type of the protectors employed may be described as consisting of insulated metallic conductors terminating in points in close proximity to a conductor in metallic connection with the earth.

In 1848 Mr. C. F. Varley, taking advantage of the lesser resistance which a partial vacuum opposes to the passage of electricity, constructed lightning protectors, in which the insulated conductors and the earth conductor were enclosed in an exhausted chamber.

In the earlier construction of these vacuum protectors the exhausted chamber was hermetically sealed by means of a resinous cement. In practice, however, it was found to be very difficult to maintain the partial vacuum in a chamber sealed in this way; and in 1861 Mr. C. F. Varley abandoned this mode of construction, and adopted lightning protectors in which platina wires fused into a partially exhausted glass bulb were placed upon a lightning protector of the original type, consisting of insulated pointed conductors in close proximity to an earth conductor. The practical use of these protectors has been almost entirely limited to the protection of the shore ends of submarine cables. The chief objection to them is that the platina wires are frequently fused, and the efficiency of the protector destroyed by the first flash of lightning striking the wires.

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[*] Paper read before Section A of the British Association at Liverpool.

When lightning storms occur in the neighborhood of telegraph wires, although the wires may not be actually struck, powerful currents are induced in the wires. These currents may be sufficiently strong in some cases to fuse the coils, but they more frequently simply demagnetize, and as often reverse the magnetism of the magnetic needles which are situated in the coils of needle telegraph instruments; and in a telegraph office during a storm, which may be a long way from the office, it not infrequently happens that the magnetic needles of all the needle telegraphs passing through the district of the storm are again and again demagnetized, and communication on these circuits interrupted for a time.

It is a well-known fact that when a discharge of high tension electricity, such as that developed by a frictional machine, or by lightning, is passed through a loop of wire, the extremities of which nearly approach one another, although the wire loop may oppose but little actual resistance to the quantity of electricity developed, the discharge will leap across the space of air separating the extremities in preference to passing throughout the length of the loop.

This arises from the momentary resistance which the wire opposes to polarization or magnetization, a resistance probably approaching to infinite resistance during an infinitely small interval of time, and the result is that, even in a vacuum protector, where the earth conductor and insulated points are enclosed in a partially exhausted chamber, the main body of the discharge will leap across the space of air separating the insulated conductors and the earth conductor outside the exhausted bulb; and in every case coming under the writer's notice, where lightning has struck wires protected by vacuum protectors, the insulated conductors and the earth conductor outside the exhausted chamber have been more or less burnt, indicating the passage of lightning.

The author, when experimenting with electric currents of varying degrees of tension, had observed the very great resistance which a loose mass of dust, composed even of conducting matter, will oppose to electric currents of moderate tension.

With a tension of, say, fifty Daniell cells, no appreciable quantity will pass across the dust of blacklead or fine charcoal powder loosely arranged, even when the battery poles are approached very near to one another.

If the tension be increased to, say, two or three hundred cells, the particles arrange themselves by electrical attraction close to one another, making good electrical contact, and forming a channel or bridge through which the electric current freely passes.

When the tension was still further increased to six or seven hundred cells, the author found the electricity would pass from one pole to the other through a considerable interval of the ordinary dust which we get in our rooms, and which is chiefly composed of minute particles of silica and alumina mixed with more or less carbonaceous and earthy matters. Incandescent matter offers a very free passage to electrical dischange, as is indicated by the following experiments. The author placed masses of powdered blacklead and powdered wood charcoal into two small crucibles; no current would pass through these masses of powder whilst they were cold, however close the poles were approached without actually touching. The battery employed in this experiment was only twelve cells.

The crucibles were then heated to a red heat, and electricity freely passed through the heated powder, and on testing the resistance opposed by the heated particles, placing the poles 1 in. apart, and employing only six cells, the average resistance opposed by the blacklead was only four British Association units, and that opposed by the wood charcoal five units.

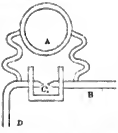
These observations go to show that an interval of dust separating two metallic conductors opposes practically a decreasing resistance to an increasing electrical tension, and that incandescent particles of carbon oppose about $\frac{1}{10}$th part of the resistance opposed by a needle telegraph coil. Reasoning upon these data the author was led to construct what he terms a "lightning bridge," which he constructs in the following way:

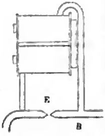
Two thick metal conductors terminating in points are inserted usually in a piece of wood. These points approach one another within about $\frac{1}{16}$th of an inch in a chamber cut in the middle of the wood.

This bridge is placed in the electric circuit in the most direct course which the lightning can take, as shown in the diagram, Fig. 1, and the space separating the two points is filled loosely with powder, which is placed in the chamber, and surrounds and covers the extremities of the pointed conductors.

The powder employed consists of carbon (a conductor), and a non-conducting substance in a minute state of division. If we consider for a moment what must follow when lightning strikes the wires (keeping in view well-established laws), we shall find that the electric discharge passing through the telegraph coils is not momentary, but occupies time.

When the insulated telegraph wire is struck the effect of the electric discharge is to polarize and magnetize the line wire throughout; after the discharge the wire returns to its normal unpolarized condition, but, as is well-known, the cessation of the magnetization although very rapid is not instantaneous, and as is also well understood the effect of the wire, assuming its normal unmagnetic condition, will be to develop an electric current flowing in the same direction as the electric discharge which magnetized the wire.





The tension of the current developed by the demagnetization will be very great at its first development, and it will rapidly afterwards fall to zero. We therefore have, first, the main discharge of electricity of very high tension which passes by the shortest route, and which does not wait to polarize the coil wires, but leaps across a space of air to the earth conductor as the easier course followed by a secondary current flowing in the same direction, but occupying time.

The tension of this secondary current, although at first very high, is not nearly so great as the lightning discharge. And the greater portion, if not the whole, of it will pass through the coils which oppose; when time is given, a much lesser resistance than the smallest possible space of air. It would, therefore, seem when telegraph circuits protected by ordinary protectors are struck by lightning, it is to this secondary current and not to the main discharge the fusion must be attributed.

The fusion of the platina wires in the vacuum protectors must also be attributed to this secondary current, and not to the main discharge

The coils of needle telegraphs are more frequently fused than those of other telegrapic apparatus in which electro magnets are employed, and this is, in the author's opinion, a strong confirmation that the fusion of the coils is due to the secondary current developed by the demagnetization of the line wire.

The relay coils used in other telegraph systems have soft iron cores which become magnetic when a current is passing through the coils. And a greater amount of magnetism is developed in the cores than in needle telegraph coils, but a very sensible time is occupied by the soft iron cores passing from the normal to a magnetized condition, and when the line wire of such a circuit is struck by lightning, the tendency of the secondary current developed by the demagnetization of the line wire is to magnetize the soft iron cores. The momentary resistance these cores oppose to magnetization is very great; the demagnetization of the line wire, therefore, proceeds more slowly, the electricity generated by the demagnetization being of a definite amount; the tension of the secondary current is proportionately reduced in accordance with the time occupied by the demagnetisation, and the coils are not so liable to be fused. The retardation which the magnetization of an electro-magnet opposes to the demagnetization of another one is well known, and is explained in "Culley's Handbook of Electric Telegraphy." The author refers to it because he is most anxious to advance only that which is the result of his own direct experiment, or is based upon well-established laws generally accepted by leading electricians. The action can be better illustrated by a diagram, Fig. 2, which represents a Morse telegraph circuit having a lightning protector connected to it.

The line wire of a telegraph circuit is only a continuation of the coil wires, and is rendered magnetic in the same way by electric polarization, the chief and almost the only difference being that in the coils the magnetism is concentrated in a much smaller space. The force of the lightning may be regarded as irresistible, and if there were no other channel excepting the convolutions of the electro-magnets, it would pass through them. The lightning magnetizes the line in its passage, and leaps the space separating the points of the protector, as the easier course, and does not magnetize the electro-magnets. Demagnetization of the line wire, which always takes time, and which can be retarded, follows, and the resistance which the soft iron cores oppose to the assumption of the magnetized condition, does retard the demagnetization of the line wire, reducing the tension of the secondary current.

Needle telegraph coils not having a mass of iron in them to be magnetized, demagnetization of the line wire follows much more quickly; the secondary current is more intense, and the coils more often suffer.

We have now to consider the behavior of the lightning bridge in a circuit struck by lightning.

The lightning finds in its direct path, not a space of air, but a bridge of powder, consisting of particles of conducting matter in close proximity to one another; it connects these under the influence of the discharge, and throws the particles into a highly incandescent state. Incandescent matter, as has been already demonstrated, offers a very free passage to electricity, and the secondary current developed by the demagnetization finds an easier passage across the heated matter than through the coils.

The reason a powder consisting entirely or chiefly of conducting matter, cannot be safely employed, is that, although in the ordinary conditions of things it would be found to oppose a practically infinite resistance to the passage of electricity of the tension of ordinary working currents when a high tension discharge occurs, the particles under the influence of the discharge will generally be found to arrange themselves so closely as to make a conducting connection between the two points of the lightning bridge. This can be experimentally demonstrated by allowing the secondary currents developed by a Binnkoff's coil to spark through a loose mass of blacklead.

The crucial test, however, is the behavior of the bridge in practice.

These lightning bridges have been in use since January, 1866, more than four years. At the present time there are upwards of 1,000 doing duty in this country alone, and not a single case has occurred of a coil being fused when protected by them.

◆

MONTREAL TELEGRAPH COMPANY.

The Company was organized in January, 1847, with a capital of $60,000. The line extended from Toronto to Quebec, a distance of 540 miles; nine offices were opened and thirty-five persons employed. The number of messages transmitted during the first year was 33,000.

Since then the Company has, year by year, continued to extend its lines, not only in the Provinces of Ontario and Quebec, where nearly every village of any importance has been afforded ample telegraphic facilities, but also through the Province of New Brunswick, and in the State of Maine, New Hampshire, Vermont, New York and Michigan, in which 110 offices are owned by this Company.

The statistics up to the 30th November, 1870, show that the Company possesses 7,800 miles of poles, 12,147 miles of wire, 640 offices, and 906 employees. Number of commercial messages sent over the lines during the year 1870 was 1,060,000. Number of words transmitted over Atlantic cable 153,093. Number of words furnished to the press upwards of 8,000,000. To give an idea of the facilities that the Company has at its command it is only necessary to mention that during the last parliamentary session it was customary to transmit night after night, from its office at Ottawa, 20,000 to 50,000 words to the press, and on the night of the 17th February as many as 67,251 words were transmitted.

The lines of the Company begin at Sackville, N. B., and extend to Sarnia, at the outflow of Lake Huron.

They also run from the United States border to the Georgian Bay and the most northern towns of Canada.

The Company has wires along all the railways in the Provinces of Ontario and Quebec, and as soon as the Intercolonial Railway is built, their wires will be extended over the whole of the road.

In transmitting cable dispatches they are sent direct to Sackville, N. B., the present terminus of the Company's lines, over a circuit of 750 miles.

The Company has likewise branches from Montreal working direct through its connections to the following cities in the United States:

Portland, Maine	300	miles.
Boston, Mass	350	"
New York, N. Y	450	"
Oswego, N. Y	290	"
Buffalo, N. Y	450	"
Detroit, Mich	550	"

During the year 1870, the Company erected 821 miles of poles, strung up 1,920 miles of wire, and opened 86 new stations. In 1871 they will string an additional wire of 450 miles from Montreal to Buffalo, and have agreed to build lines through the remote districts of Bonaventure and Gaspe, which will be of great service to the fishing interest of that neighborhood, as well as to the shipping entering the St. Lawrence.

◆

AUSTRALIAN TELEGRAPHY.

The colony of South Australia, founded only so recently as 1836, is entitled to the credit of having inaugurated one of the boldest telegraphic enterprises of modern times, its Government having embarked in the gigantic undertaking of carrying a line of posts and wires right across the vast island-continent of Australia from south to north, that is from Port Augusta, in the north of the old borders of South Australia, to Port Darwin, in the "Northern territory," which is now being opened up for settlement. The work has been started from both ends, and the contract for the northern portion from Port Darwin southward has been taken by Messrs. Darwent and Dalwood. The central portion of the intended line is to be constructed by the South Australian Government under the superintendence of Mr. C. Todd, the head of its telegraphic department. A third and southern section of 500 mi is to be constructed by Mr. E. M. Bagot. A cable has been already laid from Singapore to Batavia, and the link between Batavia and Port Darwin only remains to be made good to place the northern shores of Australia in telegraphic communication with England. The existing Australian settlements being situated in the west, south, and east, the question still remains to be solved how they are to be brought into telegraphic union with Port Darwin. The South Australian Government has declared boldly for the execution of its scheme for a line from Port Augusta to Port Darwin right across the vast interior of the island-continent; and with this object the Agent-General of South Australia appeared a few days since in the London money market as a borrower of £108,000 for the execution of the Port Darwin and Port Augusta line. There are not wanting some critics who pronounce the Port Augusta and Port Darwin scheme impracticable, as the line will have to be carried through a trackless desert, presenting great difficulties in the way of construction and maintenance. These critics argue in favor of a land line from Port Darwin to Rockingham Bay, where the land lines of Queensland, the north-eastern colony of Australia, will be reached. But just now Queensland holds itself aloof from Port Darwin; the South Australian Government stands committed to its self-imposed work; and and what is still more to the purpose, perhaps, it has actually commenced it. The British and Australian Telegraph Company has closed with the proposals made on the subject by the South Australian authorities; and as the matter at present stands, it is hoped and promised that the Port Augusta and Port Darwin line will be in working order by the close of 1871.

Mr. Todd, the indefatigable telegraphist of the South Australian Government, has applied himself with characteristic energy to the prosecution of a work which will confer lasting reputation upon him, if he succeeds in its execution. The shortest distance of the Port Augusta and Port Darwin line from point to point will not be less than 1,600 miles, the route to be followed passing through a vast wilderness, in attempting to traverse which, in 1845, that lion-hearted Australian explorer, Captain Sturt, although supported by a sturdy band of followers, nearly perished. In dry seasons the 1,600 miles of wilderness, which Mr. Todd has to overcome, are an arid desert of sand and scrub; in those rare years in which Australia has too much rain it is a succession of swamps and floods, presenting almost equal obstacles in the way of the traveler or the engineer. Notwithstanding all this, Mr. Todd, relying upon the energies of the three working parties—his own, Mr. Bagot's, and Messrs. Darwent and Dalwood's—estimates that he can carry out in fifteen months and for £120,000 the arduous undertaking in which his Government has embarked. Certainly Mr. Todd has a bold heart, since he and his assistants will have to transport in carts or on camels large quantities of wire and telegraphic material (including posts in some places) for considerable distances, while the carriage of provisions and water for the working parties will also be a serious matter. However, thus far there has been no turning back from the work which has been taken in hand. We learn that Mr. Todd has left Adelaide for the mysterious interior of the island-continent, in order to see the Government party, which has to construct the central portion of the line fairly started upon its work. Still we have to look for ulterior intelligence as to the effect of the undoubted natural obstacles which have to be overcome.

The present position of the important work of establishing telegraphic communication between London and Melbourne, Sydney, Adelaide, and Brisbane, is consequently just this: The great South Australian Port Darwin and Port Augusta scheme seems to be by no means assured of success; and the British and Australian Telegraph Company has not yet come to any alternative terms with the Government of Queensland. But should the South Australian Government find itself put out of court by what the French term "circumstances of greater force," the Queensland Government would probably be willing to listen to overtures even from Port Darwin; and no one can suppose that a direct telegraphic line between Great Britain and the south and east coasts of Australia can long remain an unsolved problem.—*Engineering.*

◆

Sir Charles Wheatstone has just added to his many electrical inventions the completion of a printing instrument. This resembles a piano, having a key-board of 25 notes, each answering to a letter in the alphabet, several of which can be used for stops and numbers. The most frequently occuring letters are situated towards the centre, so that an operator need rarely move his hands from one position. Great speed is thus obtained, and the advantages of this invention are manifestly great, as, if necessary, a printed copy of the forwarded message can be had by the sender of a message.

◆

Raising the "Captain."—A correspondent of the *Engineer*, having reference to the possible raising of the iron clad Captain, says: "For accurately finding out the position of this ship electro magnetic appliances may be used. They would consist of cables inclosing conducting wires, and having attached to their ends magnetic arrangements for dragging along the sea bottom, in order that when they touch any iron portion of the ship, through magnetic attraction, causing completion of the circuit, an indication would be given at the surface. After thus discovering the spot, the longitudinal position of the ship and other details are ascertainable by similar means."

THE TELEGRAPH.

List that mystic lever's click
Printing letters, clear and quick;
He who guides their speaking play
Stands a thousand miles away!
Here we feel the electric thrill
Guided by his simple will;
Here the instant message read
Brought with more than lightning speed.
    Sing who will of Orphean lyre,
    Ours the wonder working wire.

Let the sky be dark or clear
Comes the faithful messenger;
Now it tells of loss and grief,
Now of joy in sentence brief,
Now of safe or sunken ships,
Now the murderer outstrips,
Now of war and fields of blood,
Now of fire, and now of flood.
    Sing who will of Orphean lyre,
    Ours the wonder working wire.

Think the thought, and speak the word,
It is caught as soon as heard,
Borne o'r mountains, lakes and seas
To the far antipodes.
Boston speaks at twelve o'clock,
Natchez reads ere noon the shock;
Seems it not a feat sublime?
Intellect has conquered time!
    Sing who will of Orphean lyre,
    Ours the wonder working wire.

Marvel! triumph of our day,
Flash all ignorance away,
Flash sincerity of speech
Noblest aims to all who teach;
Flash till power shall learn the right,
Flash till reason conquer might;
Flash resolve to every mind,
Manhood flash to all mankind.
    Sing who will of Orphean lyre,
    Ours the wonder working wire.

ANON.

◆

THE GREAT NORTHERN TELEGRAPH—CHINA AND JAPAN EXTENSION TELEGRAPH COMPANY.—The entire amount of cable required for the China and Japan extension of the Great Northern Company has been manufactured, and the first section is now in course of submersion. The account of this interesting work has been delayed until the completion of the manufacture of the cable; that event having taken place, we now bring before our readers some details of this work.

The Great Northern Telegraph has possessed an extensive system of submarine telegraphy for the same time, embracing a series of cables from Denmark to England, Norway to Scotland, and from Denmark in the Baltic to Russia, besides other smaller lines, and in bringing forward the present extension in January last, it was brought out as a separate company, working in connection with the Great Northern Telegraph. Its objects were: "This company, constituted under Danish law, has been formed for carrying out a concession granted by the Russian Government for connecting China and Japan with Europe through Russia. The first cable will be laid from Possietta to Shangai, either direct or, if deemed advisable, touching at Nagasaki or other convenient points in Japan; the next section will extend from Shangai to Hong Kong." This system of cables will by reason of a Russian undertaking be placed in communication with the through system of Russian telegraphy.

The amount of cable required was 2,296 knots, divided into two sections—

Hong Kong to Shangai	1,098 knots
Shangai to Possietta	1,198 "
Total......	2,296 "

On the completion of the whole line, messages will be transmitted through Russia, and the submarine cables of the company in the Baltic and North Sea to England; the Russian system of telegraphy is spoken of as being very efficient, and a good service is anticipated. About the same time that these submarine lines are completed, there will be submerged cables from Singapore to Hong Kong, and by means of the cable lately laid to Batavia, and the one now laying to Madras, the northern and all parts of China will be in direct telegraphic communication with India, and with all the important points in the far East; the further extension from Java to Australia will offer an additional stimulus, and it may fairly be expected that from commercial relations alone a fair revenue will accrue to all these lines.

THE U. S. SIGNAL SERVICE.

The post of Fort Whipple, Virginia, has been maintained during the past year as a school of instruction and practice in the duties of the signal service, at which such officers of the army and navy as might be designated for instructors in this branch of military duty, in their respective services, may themselves first receive a thorough knowledge of it. It has been an object also to maintain a nucleus for the service capable of being expanded upon any emergency. The equipments of the school for field practice have consisted of one section of a field telegraph train, complete in its appointments, eight telegraphic instruments and batteries, and the necessary testing apparatus for the instruction rooms, and the requisite sets of signal equipments for day and night signalling. The theoretical instruction comprehends the study of the army manual of signals, the cipher manual, the text-book of practical telegraphy, and discourses, together with oral instructions by the instructor. An inspection of the school on the 19th of March, 1870, by the Honorable Secretary of War, resulted in his expressed satisfaction with its management, and the authorization to increase the strength of the signal service detachment there stationed to the minimum of a company, to appoint the necessary non-commissioned officers for the detachment, and to erect such temporary structures as were necessary to increase the efficiency of the school and promote the comfort of the command. During the year thirty-eight officers have been under instruction at the school, thirty-one of whom belonged to the navy, four to the army, and three to the marine corps. Of these, thirty completed the full course of instruction, and were declared competent as acting signal officers and instructors. Of the officers of the navy instructed, twenty-three have been assigned to vessels of the navy now in service, to diffuse, as instructors in their turn, a knowledge of the signal service throughout the navy, and to so provide for the thorough co-operation of the land and naval forces whenever occasion may require. The officers of marines instructed have been in charge of similar instruction given in the corps of marines. Of the army officers who passed the course, two have been assigned to duty as instructors, one as assistant in this office, and the other temporarily as officer in charge of the signal service detachment. In addition to the officers instructed in the school, forty-one observer sergeants, intended for assignment in the division of telegrams and reports for the benefit of commerce, have received, within the year, the theoretical and practical instruction necessary to fit them for their duties. In the pressure of other duties, the experimental practice usually had at this school, for the improvement of the signal and military telegraphic apparatus, had been, to a great extent, suspended. The established drills have, however, been continued and improved. It is hoped that facilities may be given to provide, during the ensuing year, a field telegraph train, as a model, as perfect in all its parts as ingenuity and experiment can make.—*Report of the Chief Signal Officer.*

◆

THE ST. THOMAS AND PORTO RICO TELEGRAPH.—The West India and Panama Telegraph Company (Limited) state that they have received advices that the submarine cable has been successfully laid between the islands of St. Thomas and Porto Rico, and will be immediately opened for public traffic. They add that the section between Porto Rico and Jamaica is being proceeded with.

◆

THE MADRAS AND SINGAPORE TELEGRAPH.—The British Indian Extension Telegraph Company have received intelligence of the successful laying of their cable between Singapore and Madras. This completes the line of submarine telegraphic communication from England as far as Batavia.

BULLS.

Among the many operators in this section, are a few who are sadly in need of practice, or instructions, in regard to sending, and whose writings comes very shaky. Receiving from one of these the other day, I got the following:

"Meet *me* and COG BROUGH on the next train." Is tha Cog Brough? (not entirely satisfied) yet the affirmative answer, Yes! convinces me it was sent so. Thanks to the author of "Cog Hog" I am shown the "evil tenor of my way," and should have written *come through.*

This is not so bad as the following:

———— 18th.

To ———— Cashier.

"Is David Subbin's note good for five hundred dollars? Answer quick. ————"

Out rushed boy, back in two minutes. Distant office raised first call. "Here's your answer:"

"David Subbin's is not worth a cent, don't know him!
———— Cashier. 10 collect."

"O.K.! No! Great Heaven's! That's the worst I ever saw," comes tingling back from distant station: "Is that David Subbins?" Yes! The bank closes in ten minutes; Jerusalem! the man has placed his entire dependence on the answer of that message. Here take this quick, repeats message which comes: Is "Daniel Hubbins," &c. Out goes boy again, back in time, with the satisfactory answer that, "*Daniel Hubbins* is good for any amount." But the effect upon his nerves must have been fearful when, the same day, he copied "*Dromber*" for December, without discovering the error. The day following, another operator received the following: "Must I send the '*Porta*' to-day?" The "Porta," of course should be "*Pork.*" U.

These are not all bulls. They are evidence of an inability to manipulate correctly. It seems impossible for some so-called operators to count dots or make a respectable k or h. Honestly, such operators should not be allowed to send a single message.

HOW TO MULTIPLY OFFICES.

The following is too good to be lost, and we give the lady the benefit of the last word on this prolific subject:

CADIZ, O., January 11, 1871.

Dear Journal.

While reading in your columns some of the remarkable instances of one person filling many offices, the question occurred, —"Are they *all* or any of them married?"—If not, and they would excel in that of which they boast, let them profit by this hint, from a lady, and get married as soon as possible.

Inasmuch as "man and wife are *one*," the offices held by each must belong to one, so by acting upon this hint you may more than double your present number, finding not only that your wife is, as she is often styled, "the better half," but that she holds the larger half of the offices.

Quite a number of ladies are employed in the telegraph service. By selecting such a one, you may duplicate quite a number of your offices, and, if you chance to hit upon the right one, may claim the following in addition:

Mantua Maker, Milliner, Family Sewer, Tayloress, Darner, Patcher, Manufacturer of Comb Cases, Letter Pockets, Lighter-boxes, Catch alls, &c. Baker, Cook, Dish-washer, Table-waiter, Coal-carrier, Chamber-maid, Street-sweeper, Wash-woman, Ironer, General-house-cleaner, Gardener, Hair-dresser, Ex-School-teacher, Amanuensis, Authoress, Poetess, Methodist, Sunday-school-scholar, Biblical-student, Musician, Private-lecturer, Regular-scold, General-querist, Private-missionary, Anti-tobacco Advocate, Temperance Advocate, Member of home council, General errand agent, Interpreter, Confidante, Private correspondent, Morse Testimonial Advocate, W. & W. Sewing Machinist, dear little niece's Antie, Somebody's-cousin, Nobody's Sweetheart. *Not* a Woman's Rightser-Independent-Candidate for the Poor-house, (if I can't do any better when the day of health and activity is over).

But I'll cease to enumerate lest you should think me overtaxed already, and refrain asking me to extend my duties and responsibilities. What do you say "brethren?" Shall I send in another fifty list? "M."

◆

To the Editor of the Journal of the Telegraph.

DEAR SIR:—I understand "cannot" to be one word, but when written separate "can not" to be two words. Am I correct? Please answer in JOURNAL. S. C.

Answer. Exactly so.

MORSE TESTIMONIAL FUND.

As we close the present list, only $640 remains to be received to meet the cost of the statue. A few expenses and losses by mail will add to, and some interest will reduce the amount. We now expect generous responses from many who have waited to come in on the home stretch, and crown the undertaking with complete success. We will be glad to see among the closing records the names of men who have stood among their brethren silent and untouched by the general enthusiasm, whose good hearts would be better for the giving. From another small class we expect nothing; yet even these were needed to give spice to success, and have done good service. Men and women need obstacles to give them a chance to chuckle, and so ye 4,000 or more contributors, you shall have your right of exultation confirmed in the same way. Meanwhile let all inquirers know that

"While the lamp holds on to burn, &c.

The plaster cast of the Statue will be exhibited privately on Saturday evening, February 4th, at Bogardus' Art Rooms, 1153 Broadway, N. Y., and to the public on Monday, February 6th.

RECEIVED SINCE LAST ISSUE.

We are happy to receive the following from Mr. Cornell:

Custom House, New York,
Surveyor's Office,
January 21, 1871.

Dear Mr. Reid:—I have just found among some papers in my desk, a check for $25, which I drew, as you will see, six months ago, for the purpose of sending to you as my contribution to the memorial fund in honor of Prof. Morse.

Having been a practical telegraph operator for twenty-five years, (commencing at the age of fourteen), during nearly all of which time I have enjoyed the pleasure of a personal acquaintance with Prof. Morse, it affords me much gratification to unite with the fraternity in erecting a memorial, which shall in a permanent manner evince our appreciation of the inestimable benefits which his genius has bestowed upon the world.

With great respect,
Yours very truly,
A. B. Cornell.

James D. Reid, Esq.

A. B. Cornell, surveyor Port of New York	$25 00
D. Deven, supt of construction, New York	5 00
J. R. Cobourne, Jackson, Tenn., 2d sub	1 00
E. C. Trouslot, Summit, Ill.	1 00
D. E. Trone, opr and manager, Hanover, Pa.	1 00

Very truly yours, "Two Sisters," not far from Boston, with whom the Journal is a favorite	$2 00

We welcome the following from the hands of an old friend.

DELAWARE AND HUDSON CANAL CO.

Albany, N. Y., Jan. 13, 1871.

Dear Sir:—The undersigned desire to have a little finger, if not a "hand," in the bronze statue of Prof. Morse.

Yours, S. E. Mayo, Gen. Ticket Agent.

S. E. Mayo, supt of Tel. Alb. & Susq. R.R., Albany, N. Y.	$5 00
J. S. Fox, opr C. V. S. & A. R R., Sharon, N. Y.	5 00
G. H. Thurber, manager, East, N. Y.	2 00
H. S. Rowley, agent C. V. S. & A. R.R., Seward, N. Y.	1 50
L. C. Whitney, manager, Harpersville, N. Y.	1 00
S. McMasters, baggage-master, Harpersville, N. Y.	50
W. H. Dunning, opr, Richmondville, N. Y.	1 00
R. K. Teller, manager, Unadilla, N. Y.	1 00
W. J. Hughston, manager, Port Crane, N. Y.	1 00
S. Hershberger, Cooperstown Junc., N. Y.	1 00
H. Chester, manager, Schenevus, N. Y.	1 00
D. Powers, baggageman, East N. Y.	1 00
Geo. McGregory, agent A. & S. R.R., East, N. Y.	1 00
W. R. Sloan, opr, Afton, N. Y.	1 00
F. Champlin, student, Afton, N. Y.	1 00
G. M. T. Johnson, clerk A. & S. R R., Binghampton	1 00
J. J. M. Brown, manager, Cobbleskill, N. Y.	1 00
H. A. Masier, Jr., operator, Cobbleskill, N. Y.	1 00
E. Blooney, opr, Cobbleskill, N. Y.	1 00
H. T. Dana, agent A. & S. R.R., Cobbleskill, N. Y.	1 00
R. L. Asterhout, express agent, N. Y.	1 00
	$30 00

We repeat the following names to get them correct:

Alfred Connor, E. Dorset, Vt.	$1 00
Frank Pooler, Wallingford, Vt.	1 00
T. D. Shaw, Manchester, Vt.	1 00

Another list from one of our old boys:

COLUMBUS, OHIO.

Thomas S. Gates, mgr	$1 00	R. T. Howard, opr	$1 00
Geo. Cole, chief opr	1 00	B. F. Wilber, opr	1 00
C. W. Ross, opr	1 00	C. H. Foster, opr	1 00
Fred. W. Snell, opr	1 00	Geo. W. Donaldson, opr.	1 00
H. S. Converse, opr	1 00	F. P. Ross, opr	1 00
Jno. W. Cleary, opr	1 00	J. H. Dunn, opr	1 00
			$12 00

CAIRO, ILLINOIS.

Henry H. Candee, ex-operator	$1 00
A. B. Safford, cashier City National Bank, Cairo	1 00
Willie Q. McGee, messenger W. U. Tel.	1 00
	$3 00

FROM MAINE.

We are glad to hear so nobly from Maine. Dunkirk and Bangor started the lists and gave spirit to the movement. Now their fellows follow them. And let all the people say Amen.

M. C. Austin, manager, Ellsworth	$2 00
M. G. Blaisdell, pupil, Ellsworth	1 00
M. A. Stockbridge, pupil, Ellsworth	1 00
Tommie Lee, messenger, Ellsworth	25
Colin McKenzie, repairer, Ellsworth	2 00
May Holden, opr, Southwest Harbor	1 00
R. G. Salisbury, opr, Somesville	2 00
J. A. Small, opr, Cherryfield	2 60
N. Y. Bradford, foreman repairs, Cherryfield	5 00
W. H. Bradford, repairer, Cherryfield	1 00
F. J. Moore, opr, Machias	1 00
Seward Leavitt, messenger, Machias	25
Robt. A. Lamb, repairer, Machias	1 00
G. W. Kilby, opr, Dennysville	1 00
Angus McIsaac, repairer, Dennysville	2 00
S. W. Hoskins, operator, Oldtown	2 00
F. A. Hooke, ex-supt, Castine	5 00
P. J. Hooke, opr, Castine	2 00
A. H. Genn, opr, Bucksport	2 00
S. Frank McKay, opr, Newport	2 00
John H. Tinker, opr, Lewiston	2 00
Wm. E. Hartwell, messenger, Lewiston	1 00
E. B. Pillsbury, opr, Belfast	2 00
Wm. W. McLauchlan, opr, Pembroke	1 00
Fred. E. Boothby, Maine Central R.R. office, Waterville	2 00
E. H. Jordan, opr, Waterville	2 00
Austin F. Kingsley, opr, East Machias	2 00
Roscoe Pierce, asst. opr, East Machias	1 00
Ruel Smith, ex-opr, Bangor	2 00
Wm. H. Small, agent Maine Central R.R., Bangor	5 00
H. J. Pettengill, opr, Augusta	2 00
Geo. H. Cushing, manager, Eastport	2 00
W. J. Parritt, messenger, Eastport	1 00
Saml. Black, manager, Calais	4 00
Frank Nelson, ex-manager, cashier Calais National Bank, Calais	1 00
	$65 50

MORE FROM MR. ROWELL.

F. M. Perry, manager, Barton, Vt.	$1 00
Charlie Billings, messenger, Barton, Vt.	25
J. S. Welch, manager, Hartland, Vt.	1 00
Geo. P. Brown, manager, Winchester, Mass.	1 00
A. Fobare, repairer, Groton Junc., Mass.	50
	$3 75

STILL MORE.

A. P. Fitch, manager, Wilton, N. H.	$1 00
F. G. Dickey, manager, Milford, N. H.	1 00
F. E. Nims, manager, Nashua, N. H.	1 00
H. A. Sheridan, operator, Nashua, N. H.	1 00
Walter Wright, operator, Nashua, N H.	50
Frank Barr, operator, W. and N. Depot	50
Geo. W. Sargent, operator, W. and N. Depot	50
	$5 00

ROCKFORD, ROCK ISLAND AND ST. LOUIS R.R.

Dear Sir:—Please credit the following operators on this line for contributions to the Morse Statue.

Yours, G. L. Walker, Train Dispatcher.

J. C. Boothe, opr, Greenfield, Ill.	$2 00
A. J. Lee, opr, Greenfield, Ill.	1 00
T. V. Finney, opr, Arenzville, Ill.	1 00
T. H. Chambers, opr, Concord, Ill.	1 00
W. M. Thomas, opr, Merritt, Ill.	1 00
Ed. Wunder, opr, Winchester, Ill.	1 00
J. Tankesley, Thompson, Ill.	1 00
W. W. Heaford, opr, Medora, Ill.	1 00
W. H. Monson, opr, Piasa, Ill.	1 00
W. C. Everingum, opr, Allen Junc., Ill.	1 00
	$11 00

SANDUSKY, O.

Sandusky, O., Jan. 25.

Dear Sir:—Please accept our mite and number us with subscribers to the "Morse Testimonial Fund."

Yours, John W. Hunter, Manager.

Thomas R. Tattavall, operator	$1 00
Ch. V. Olds, citizen	1 00
W. H. Bannister, B. & O. Depot	1 00
C. S. Hurlbut, B. & O. Depot	50
W. J. Ferguson, B. & O. Depot	50
J. W. Hunter, manager	1 00
	$5 00

FROM A HAPPY FATHER.

San Antonio, Texas.

A fine boy, born yesterday, incloses his mite to the statue of our telegraphic Pater. May he live to see his statue unveiled, and enjoy many more years of life and happiness.

N. J. Patrick, Manager.

——— Patrick, Jr., (sound operator)	$1 00

Union Stock Yards, Illinois.

Dear Sir:—Inclosed please find $7 50, contributed towards the Morse Testimonial. Respectfully,

J. Q. Mason, Manager.

J. Q. Mason, Manager	$3 00
F. M. Crittenton, bookkeeper	3 00
R. S. Gough, operator	1 00
F. H Ketcham, messenger	50
	$7 50

B. C. & P. R. ROAD.

Dear Sir:—Inclosed please find $8 00, contributed on the road toward the Morse Memorial Fund. Yours,

O. E. Tiffany.

O E. Tiffany, Mayville, N. Y.	$3 00
J. Conn, Prospect, N. Y	1 00
A. L. William, Sherman, N. Y.	1 00
W. H. McNaughton, Panama, N. Y.	1 00
E. Cole, Clymer, N. Y.	1 00
Chauncy Wright, Corry, Pa.	1 00
	$8 00

Greenville, O., January 26, 1871.

Dear Sir:—Inclosed please find our mite for "Morse Fund." Hope we are in time. Yours, truly,

James H. McAlpine.

James H. McAlpine, manager	$1 50
William King, operator, P. C. & St. L. Ry	1 00
John Hess, operator, P. & A.	1 00
Thomas McAlpine, operator	50
Frank Arnold, messenger	50
Charles Howard, messenger	50
	$5 00

NEW YORK, NEWFOUNDLAND AND LONDON TEL. CO.

CAPE BRETON.

Dear Sir:—I have much pleasure in forwarding the inclosed list from Cape Breton for the Statue to "Father Morse."

Yours, T. D. Scanlan.

William McDonald, Glace Bay	$2 00
William McDonald, Aspe Bay	1 00
Donald McLennan, Indian Brook	1 00
David Hamilton, Port Hastings	1 00
E. P. Earle, Port Hastings	1 00
W. E. Earle, Port Hastings	1 00
T. D. Scanlan, Port Hastings	1 00
E. S. Stirling, Port Hastings	1 00
Nathaniel Martell, Port Hastings	50
Henry Patrequin, Port Hastings	1 00
T. C. James, Port Hastings	1 00
Samuel Nicholson, Port Hastings	25
Peter Grant, Port Hastings	1 00
M. Scanlan, North Sydney	1 00
O. H. Chipman, North Sydney	5 00
J. P. Ward, South Sydney	1 00
David Dunlop, Baddeck	1 00
Annie Gynan, St. Peters	1 00
Mary Jane Grant, Hawkesbury	50
Maretta Treen, Arichat	1 00

The following donations were handed to Miss Treen by friends in Arichat:

Miss Bissett	1 00
A. P. Secton	1 00
Mr. C	1 00
Miss Fixott	1 00
H. S. Donovan	50
Other Friends	4 50
	$33 75
Premium on gold	3 00
	$36 35

J. W. Van Vliet, Lake City, Minn	$1 00

Geo. C. Fleming, student, Young America, Ill	$1 00
Samuel L. Trues, Crisfield Md	1 00
A. N. Rousch, messenger, Bay City, Mich	50

◆

Transferred.—F. W. Conn, formerly day operator, Brocton, N. Y., to night operator, Dunkirk, N. Y. C. M. Frost, Buffalo, N. Y., has been transferred to Jamestown, N. Y.

◆

The French Atlantic Cable.—The traffic now being forwarded through the French Atlantic cable averages above 7,000 words daily, being at the rate of five words a minute for the whole 24 hours, a speed which suffices to clear off all the messages sent within the day. On some days nearly 10,000 words have been transmitted in the 24 hours, showing that the capacity of the cable is much more than sufficient to convey the present average traffic.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, FEBRUARY 1, 1871.

MAGNETIC MOTIVE POWER.

If we mistake not, we are in the dawn of a new and economic motive power. We have long had an instinctive expectation of its approach. Now, by the scientific exposition of the possibility of an infinitive development of magnetic power by an apparently inadequate initial force, as argued by Mr. Highton, in our issue of January 1, and the apparent product of it before our senses, seemingly verifying the argument, we are strongly induced to hail magnetism as the coming worker for millions of men and for purposes innumerable. Some will smile at this. It is right they should. The idea has been discouraged by electric writers as visionary and impracticable. They have asserted the impossibility of any such economic use of material for the production of magnetic power, as could ever justify the hope of its substitution for steam. They were right so long as the battery was regarded as the source of power instead of a mere initiative, such as results now seem to prove it to be. Our theories of electro-motive force may require to be re-examined, and, perhaps, changed. The axiom that a given magnetic force is the exact product of a given consumption of zinc or chemicals, must now be challenged and put to proof. We confront now the proposition that, although the electro-motive force may be in the battery, yet that the magnetic power which follows its application is capable of indefinite enlargement without increase of the initiative agent. We are brought face to face also with the fact that when a magnet is performing its maximum work, the battery which started the magnetic power is most at rest! In other words, that the magnetic power is not proportioned to the size or consumption of the elements of a battery, although dependent upon it as an initial force. We do not pretend to explain this problem, but we can tell what we have seen. It seems to corroborate the recent position taken by Mr. Highton, of England, another of whose articles we reproduce to-day from that excellent paper the *London Chemical News*, and to prove that we are on the border-land of a new and wonderful series of development of an economic, safe, and efficient motive power. It may prove that our assumed data as to the power resident in our battery material has been underrated, and their productivity misunderstood. Let us now state what what we have seen.

A few days ago we accompanied, on invitation, several gentlemen to the works of Mr. H. M. Payne, of Newark, N. J. On a small shelf we found a Daniels battery of four cells, the ingredients of which were the bi-chromate of potash in the porous cell, and dilute sulphuric acid, of ordinary strength, in the outer vessel. It was entirely inodorous. Beneath it, firmly bolted to the floor, was an iron circular frame, of a diameter of about eighteen inches, the width of the periphery or rim being about five inches. Five apertures equi-distant were cut into the edge or face of this iron case, three and a half inches in length and of the width of the frame. Into these were inserted the faces of five iron cores, coiled with what seemed to us No. 14 covered copper wire, standing out from the frame and firmly fastened thereto. In the interior was a wheel, on whose rim were set six additional magnets, the same as on the iron case, and so set that the faces of the magnets in their revolutions would meet each other at different yet regular periods, corresponding with the double crank device in locomotives to prevent a dead centre. By acting on the periphery, all waste of power was, of course, avoided. On the shaft which extended from the magnet wheel, there was placed a belt wheel of the usual diameter, connecting with a wheel shaft on the ceiling, which, in its turn, was connected by a belt with a circular saw on a bench. No power was gained by the diameter of the wheels, as they were all equivalents of each other. The wires were then connected, when, on the instant, great rapidity of motion was at once acquired, the floor of the room shaking violently with the power developed. Pieces of wood were sawn rapidly, and without apparently disturbing the rapidity or evenness of the motion. Two gentlemen, weighing 170 pounds each, endeavored to stop the motion of the wheel by the pressure of a concave break, having a surface six inches by four, bearing on the belt wheel, but without visible effect. This rapid and effective action has been watched nine consecutive hours' by investigating parties, without any perceptible decline of power and with a consumption of less than half a pound of zinc, a cost of less than half a cent per hour. The power developed was rated at two-horse, and can be maintained for twenty-four hours without intermission at a maximum cost of ten cents. Such at least is the statement made to us by Mr. Payne, and confirmed by a well known gentleman, who thoroughly examined it. By increase of diameter and width, or by multiplication of wheels, and the number of magnets, the power can be largely increased, so we were assured, *by the same number of cells*. This was proven by the fact that by the addition of wire in the circuit of sufficient length to surround another set of magnets, no diminution of power was apparent, although the action of the battery was necessarily less; thus another wheel with similar power could have been added. The four cells we saw were stated as capable of maintaining the speed and power produced in our presence for sixty hours without renewal, at the cost of about a single stage fare on Broadway per day. Although we cannot pretend to explain the force thus developed, yet we noted four elements of power, which we state as they occurred to us:

1 The direct action on the periphery, the advantage of which needs no explanation. It is as if the crank, of a locomotive, was half the diameter of the wheel, the radius of each being alike.

2. The utilization of what may be termed the return flow of a current, which, instead of requiring to be deducted from the power of an electromotor, as in ordinary computation, is utilized and added to it. This we have not room to illustrate fully; but is a valuable agent in this motor.

3. The supposed loss of power by the action of a current through the wire of ordinary magnets, as it lays side by side in the coils, caused by the tendency to develops opposite polarity in each other, is entirely removed by inserting foil between the covered wires, which thus supplies poles on either side, and becomes an efficient insulator, preserving the complete integrity and power of the current.

4. The sharp, positive, quick action of the whole power thus applied on the answering wheel. In this there is the secret of the singular promptness of action manifest on applying the current. It is as if the whole contents of a cylinder of steam were at once flashed upon the piston-head. Indeed the power of the force so employed is largely in its sudden application. Ten pounds may thus be easily made the co-efficient of one hundred. It was suggested that the power of this motor was due to the rapid motion first obtained. This is entirely erroneous. The magnetic wheel was put in motion against a force which would have stopped a steam engine rated at double the power.

In this machine, so utterly simple as to challenge the scrutiny of the most ordinary mind, we see the dawn of a new power, capable of endless application at a minimum cost, and destitute of the usual element of danger. It occurs to us very strange that what is just being proposed as a possible status of facts by a learned divine in England, should prove the self-same theory which an American citizen has been privately and persistently developing in actual practice for years. To what it may give rise we have no prophet's ken to tell. If the premises demanded are proven to be correct, its application is infinite. We may yet see the Atlantic crossed by huge vessels, propelled without an ounce of coal, by a power the initiative of which the captain may place beside his writing desk in his cabin, which a child can apply, and the littlest finger may stop. The begrimed furnace-man may then come out from these lower hells and walk the deck as clean as the passenger, and the blazing fires be put out. And it may be that in the mysterious workings of the Almighty, these electric forces which are on every hand developing themselves as the life of the world, quickening its pulses from pole to pole, the cause of growth and the cardinal element of a power the limit of which is yet unknown, may be ordained to remove from man part of the curse of toil, unbending the laborer's back and making him to stand erect as at the first.

◆

THE MARCH OF SCIENCE.—Electricity is advancing with rapid strides in the Madras Presidency. The hour gun at Fort St. George is fired by electricity. It seldom goes off, it is very true, and when it does, it is at the wrong time; but, except for this, the electricity system as practised in Madras is a great success. Not long ago the clumsy old-fashioned habit, still in vogue in remote provincial towns, of firing the gun by hand, was in vogue at Madras, but the Presidency shot ahead of such old-world expedients. "Fire me yon gun by electricity," cried the Napier, and science, with her battery of appliances, stepped forth, and now from the Government Observatory—no less than three miles distant—the Fort gun is fired by electricity. Only, as we said before, it doesn't go off. That is, however, the gun's business.—*Pioneer.*

BASE FOR THE MORSE STATUE.

We have received, since last issue, the following notes in response to our invitation to twenty-two gentlemen to provide the granite base for the Morse statue, by subscription of fifty dollars each:

A. A. Low, Esq., Merchant, N. Y. $50 00
W. E. Dodge, Jr., Esq. Pres. Y. M. Chris. Ass. N. Y. 50 00

New York, Jan. 21, 1871.

Sir:—I take pleasure in complying with your request to contribute $50 towards the cost of the granite base proposed for the Morse statue in our Central Park. Inclosed is check for amount.

Very respectfully, Alex. T. Stewart.

Brevoort House, New York, Jan. 23, 1871.

My Dear Sir:—I thank you for the opportunity you have given me to contribute my mite to the Morse Monument, and send you by bearer $50.

Very respectfully, Joseph Hooker, Maj.-Genl.

Troy, N. Y., Jan. 23, 1871.

My Dear Sir:—With great pleasure I contribute to the fund for the "Granite Base" of Statue for Prof. Morse, and inclose my check for $50. Very truly, John A. Griswold.

FROM PROF. MORSE'S NATIVE CITY.

City of Charlestown, Mass.

Dear Sir:—I am very happy of the opportunity to personally add my mite to the fund for the base of the statue of our eminent townsman, and there are others who would be glad to do so. $50 is subject to your order.

Very truly, William H. Kent, Mayor.

Seven subscriptions are still wanting to complete this fund.

◆

In the Senate a bill has been introduced to prevent consolidation of Ocean Cable Companies.

◆

The Gardner-Hubbard bill has been introduced to Congress again. No use.

◆

A Bill authorizing the Secretary of War to negotiate for the construction of telegraph lines to Military Stations west of the Missouri River has been presented to Congress.

◆

Already we have requests made respecting a convocation of telegraph men in New York, April 27th, on the occasion of the inauguration of the Morse Statue. We will have something to say of this soon, and earnestly desire its accomplishment.

◆

The Mechanical Telegraph Instrument made by D. W. Putt & Co. is an excellent thing, and meets a wide want. It tells its own story in the advertisement on another page. Read it. Any one ordering one of us, will be credited whatever commission is allowed us on the Morse Testimonial.

◆

The Telegraph Badges are now ready for all who want them. They are elegant and cheap. The craft should have some sign of fellowship. A key is a good emblem, and worn on the breast, tells what it means. Heart to heart is the true watchword. Address Harvey & Dow, St. Johnsbury, Vermont.

◆

The Advertisements of Mr. Frey will, no doubt, have attracted attention, and we regret an error in our last number, by which the cost of the key he proposes for use is stated at $15 instead of $5. As we have stated before, this Key is a practical self-closer, and manipulates on an open circuit. All the lines in South America are worked on this principle. It enables every local battery to rest every instant the wire is unemployed. On a majority of circuits this is, at least, one half the day. Hence its importance and value.

◆

The Cleveland and Pittsburgh R. R. Reading Room at Wellsville, O., reports another successful year. The membership is 176, and the library consists of 694 volumes, in which are many valuable works. The rooms are supported by Railroad employees, and is the only one of which we know. Mr. W. G. Brownson, a telegraph manager, is secretary and treasurer. That is the reason of its success.

◆

The following, we believe, has never seen the light. We have it from Prof. Morse, who was intimate with the parties, and was in England when the *jeu d'esprit* was first perpetrated. Sheridan once made the following pun on a peculiarity of the famous Dr. Lettsom; the doctor always used the verb in the third person singular, and the pronoun, in the first person, as "I shows," "I strikes." Here is the pun:

If patients call, both one and all,
I bleeds 'em, and I sweats 'em,
And if they die, why what cares I,
I. Lettsom.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
February 1, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Jan. 15, the date of the last tariff order. Please note them in your Tariff Book:

NEW OFFICES.

346 Ackworth, Ga., reopened.
67 Bel Air, Md., reopened.
339 Coultersville, Ill.
* Colebrook, N. H.
368 Coatsburg, Ill.
Camp Stambaugh, Wy., tariff same as So. Pass, Wy.
272 Elizabethtown, Ind.
21 Foxboro, Mass., reopened.
448 Granby City, Mo.
* Holmesville, N. Y.
470 Long View, Texas.
267 Loachapoka, Ala., reopened.
10 Mattawamkeag, Me.
348 Nameoki, Ill.
*231 Norvell, Mich.
* New Berlin, N. Y.
457 Osage, Ks., reopened.
266 Oxford, Ala., reopened.
River John, N. S., tariff same as Picton, N. S.
84 Shamokin, Pa., heretofore an other line office.
387 Solon, Iowa.
130 Summit, N. Y.
66 Tamaqua, Pa., heretofore an other line office.
338 Tamaroa, Ill., reopened for the winter.
464 Woodbine, Iowa, reopened.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		Leaves this Line.
Holmesville, N. Y.,	30	2	Norwich, N. Y.
New Berlin, N. Y.,	30	2	Do.
Colebrook, N. H.,	50	3	Portland, Me.

OFFICES CLOSED.

Gower, Mo., Lawson, Mo., and Merritt, Ill.

GENERAL INFORMATION.

On and after February 1st, 1871, no "half rate" (red) messages will be taken for, or received from the Montreal Telegraph Company.

Messages may be taken for Mott Haven, N. Y. Charges for delivery from Harlem, N. Y., 25 cents, check Harlem, also, for Dorchester, Mass. Charges for delivery from Boston, Mass., 15 cents, if sent by express, or 50 cents, by special messenger. Check Boston.

The name of the office heretofore known as Beasleys Station, Ala., has been changed to Chehaw, Ala.; that of Hobbs, Ky., to Anchorage, Ky.; and that of State Line, Ky., to Guthrie, Ky.

Hereafter, the "Tariff for other lines" from Oil City, Pa., to Oleopolis and Tionesta, Pa., will be 25 and 2.

On and after February 1, 1871, the rate between offices in Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, Tennessee, and Kentucky, and San Francisco, Cal., and points on direct line between San Francisco and Omaha, Neb., *must not exceed* five dollars currency, or four dollars gold.

The gold rate will apply only on business paid in the Pacific Division.

The following are the offices west of Omaha, indicated above:

Alameda, Cal.
Alta, Cal.
Argenta, Nev.
Auburn, Cal.
Black Buttes, Wy.
Boca, Cal.
Bantas, Cal.
Bryan, Wy.
Battle Mountain, Nev.
Cheyenne, Wy.
Carlin, Nev.
Columbus, Neb.
Corrinne, Utah.
Cisco, Cal.
Colfax, Cal.
Dutch Flat, Cal.
Elko, Nev.
Emigrant Gap, Cal.
Evanston, Wy.
Fremont, Neb.
Fort McPherson, Neb.
Fort Bridger, Wy.
Gold Run, Cal.
Grand Island, Neb.
Haywards, Cal.
Kelton, Utah.
Livermore, Cal.
Laramie City, Wy.
Medicine Bow, Wy.
Menlo Park, Cal.
Mountain View, Cal.
New Castle, Cal.
No. Platte, Neb.
Oreana, Nev.
Ogden, Utah.
Oakland, Cal.
Palisades, Nev.
Pleasanton, Cal.
Promontory Summit, Utah.
Rawlins, Wy.
Redwood City, Cal.
Reno, Nev.
Rocklin, Cal.
Roseville, Cal.
Sacramento, Cal.
San Francisco, Cal.
Salt Lake City, Utah.
Sidney, Neb.
San Jose, Cal.
San Leandro, Cal.
San Mateo, Cal.
Santa Clara, Cal.
Stockton, Cal.
Summit, Cal.
Terrace, Utah.
Toano, Nev.
Truckee, Cal.
Verdi, Nev.
Virginia City, Nev.
Wadsworth, Nev.
Winnemucca, Nev.

POSTAGE TO CANADA.

Offices will note specially that postage to Canada is six (6) cents, which must be prepaid. Letters are often sent with only a three-cent stamp, which is thrown away, inasmuch as 10 cents is collected in Canada on each letter thus insufficiently stamped.

OFFICES HAVING "SPECIAL SHEET A."

On and after February 1st, 1871, when computing tariff on a message destined for an office on other lines, you will take as the "Tariff for this line" the usual tariff charged on messages to the "connecting point," or the office where the message "Leaves this line." This order, however, must not be understood as increasing present rates.

Hereafter, check Tamaqua and Shamokin, Pa., fifteen cents more than "special rate" to Philadelphia, and Hampden, Me., same as "special rate" to Bangor, Me.

ATLANTIC CABLE BUSINESS.

We are advised that the rate from London to France, "via Falmouth," is $4 38 for twenty words.

Government Cypher Messages will hereafter, be counted and charged in the same manner as other cypher messages. See modification of Rule 7, in Executive Order No. 83, issued Oct. 26, 1869.

Rates to points in the *Island of Sumatra* will be the same as to Java, West of Samarang, viz.: $36 50 for 20 words from London.

WILLIAM ORTON, President.

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ANSWERS TO CORRESPONDENTS.

Will you please inform me whether it is necessary in cleaning local batteries, to clean anything but the zincs. I have always taken them down and cleaned everything—coppers, cups, zincs, &c.; but I cannot see that it will make any difference, so long as the zincs are cleaned, and fresh water put in the cups. I have a main battery of 40 cups at my office, and, of course, would like to keep it in proper condition. How often should they be cleaned? How many words per minute is it necessary for an operator to be able to receive, by sound, to get a situation in most city offices? I can "take" about 15.

It is only necessary to clean the zincs and porous cups of a local battery. You should not throw away the sulphate of copper solution, as it never ceases to be valuable; neither should the so-called mud in the bottom of the porous cells be wasted as it is very rich in copper. This should be preserved and returned to the supply department with the old copper. For further directions, in regard to local batteries, see book of rules.

It depends upon the number of wires running out of a main battery, as to the frequency with which it is necessary to replenish it. If only one or two wires are worked from the battery, it is not necessary to renew the outer solution oftener than twice a month. The zincs of a Grove or Carbon battery should be well covered with mercury, when the battery is first set up, and then kept bright by frequent brushing. A little mercury can be added when required. No mercury should ever be put on the zincs of a sulphate of copper battery, as the action of the battery is retarded thereby. In using the solution for the outer cells of a Grove or Carbon battery, put one part sulphuric acid to 20 of water. The nitric acid should not be thrown away when only partially used, but fresh acid added as required to keep the strength up.

An operator ought to be able to receive thirty words per minute without breaking, and to make a handsome and legible copy, to fill a first-class position in a city office.

Can a customer send a "Red" under rule 13? If so, what should he pay for the 34?

Half rate messages can be sent under rule 13, and in such cases, the customer will pay for the message from the manager of the office to which the message is transmitted, informing him of his correspondents receipt thereof, one half the usual rates, or the same as for the original message.

TESTIMONIAL TO SUPERINTENDENT TUBBS.

On the sixth page of the *Republican* of to-day we print a brief notice of the presentation made to Mr. F. H. Tubbs, superintendent of the C. B. & Q. telegraph line. Since that was in type we have received considerable information in regard to the matter, which we wish to lay before our readers. The C. B. & Q. telegraph line runs over eight hundred miles of the road, and there are nearly two hundred operators at the different stations from Chicago to Burlington, Quincy, Peoria, Rushville and New Boston. On the eight hundred miles of road over which the telegraph lines run, there are between Chicago and Mendota five wires; between Mendota and Galesburg, four wires; between Galesburg and Burlington, and also between Galesburg and Quincy, three wires; and between Burlington and Keokuk, two wires; between Galesburg and Yates City, three wires; and one from Yates City to Rushville, one from Yates City to Peoria, and one from Yates City to Buda. Besides, there is the line from Galva to Keithsburg, from Burlington to Quincy, over the new Carthage road, and lines are being built from Mendota to Prophetstown, and over the Ottawa, Oswego and Fox River Valley road. All these lines stretching through this great and important country are presided over by Mr. Tubbs. He has in his employ probably as fine a corps of telegraph operators as can be found in the world, and it is not too much to say that no department of the well-managed C. B. & Q. railroad has been better conducted than the telegraph department.

Mr. Tubbs has held this position for seven years, and has quietly and unostentatiously conducted the affairs of his department. He is in his profession probably as capable as any man in the West. He is never heard pompously giving orders, and in fact does not need to do so, as every man knows that he so thoroughly understands all details connected with telegraphing that a word from him is enough. Several years ago the employees of the line commenced getting up a present for him, but Mr. Tubbs found it out and peremptorily stopped it. This year they were more prudent, and not one word was breathed that a present was to be made where Mr. Tubbs could possibly hear of it, and the first intimation he had was when he entered the office on Saturday morning and found a box containing a superb gold watch and chain, suitably engraved. It is the most beautiful and valuable present we have seen. As the watch and chain were in his possession before he knew it, Mr. Tubbs could not do otherwise than accept them. In response for this elegant and appreciative present, Mr. Tubbs publishes the following letter:

GALESBURG, Ill., Dec. 26, 1870.

To all Employees of the C. B. & Q. Telegraph Department:

With an appreciative sense of my own shortcomings and unworthiness, I accept your Christmas gift of this beautiful watch and chain. Not that they are deserved or even merited, but in the same spirit with which they are given are they accepted, and with them the hope that in the future I may deserve your friendship and esteem. We all feel a pride in this department, and I believe the feeling is shared by every officer in the company. To whatever degree of excellence and efficiency it has been brought, let me not forget to honor the company who have provided with so generous a hand, and then remember that your promptness, ready and faithful compliance with all rules, and the deep interest in the work you each and every one have taken, have borne their legitimate fruit. Quietly and steadily has the work gone on, and to-day, probably, no railway company in the country has a better system of telegraphing, or a more efficient telegraph department. Operators, despatchers and repairers have all faithfully performed their part, and to each one of you is the credit due. We have this reputation not only to maintain but to increase, and for many years to come I hope we shall all be spared to labor together for that purpose with the old C. B. & Q. Sincerely hoping that all your future holidays may be as happy as you have made my "December 25, 1870,"

I am, yours truly, F. H. TUBBS.

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

We are glad to notice the increased promptitude of remittances. It will be seen how sadly in arrears many have been.

No. 17, ASSESSMENTS RECEIVED.

24	178	342	447	501	525	586	659	771	894	990
45	182	361	472	503	530	588	684	820	905	993
58	188	394	484	504	537	599	692	824	909	
70	225	398	488	505	538	600	694	825	915	
76	227	402	494	506	554	602	701	842	918	
101	242	422	495	507	561	604	704	848	919	
118	253	428	496	508	576	606	718	858	929	
121	256	429	497	511	579	609	761	862	972	
126	271	431	499	512	581	624	765	866	977	
169	305	446	500	524	583	647	767	887	984	

NO. 18, ASSESSMENTS RECEIVED.

8	148	246	343	441	494	574	679	766	870	958
19	150	247	346	442	495	575	680	767	871	959
21	154	252	347	443	496	576	684	773	876	960
24	155	255	356	445	497	579	692	779	884	962
26	156	256	357	446	499	581	694	787	887	963
27	158	257	358	447	500	592	704	801	894	964
29	160	258	360	450	501	595	710	815	897	965
31	162	259	361	451	503	597	715	816	899	974
43	164	267	362	452	504	602	717	817	905	975
45	166	270	364	453	505	604	723	820	906	976
53	172	276	366	455	506	606	724	823	909	978
64	178	278	379	456	507	608	725	824	911	984
81	179	279	382	457	508	609	726	825	912	985
94	182	280	385	461	511	622	727	831	914	988
97	183	281	386	466	512	624	728	832	919	990
101	188	282	394	467	514	630	735	842	920	992
116	192	283	398	468	515	639	743	843	932	996
120	209	284	402	469	520	645	744	848	934	1009
127	210	285	407	470	524	650	747	850	941	1021
128	212	289	417	471	527	661	748	851	942	1026
139	226	294	422	474	528	662	749	852	946	1030
141	227	297	426	476	529	663	750	854	949	1031
142	228	298	428	481	532	664	751	855	951	1032
143	236	316	430	483	533	665	756	858	954	1033
144	239	317	431	484	561	671	762	862	955	1034
145	242	322	433	485	570	677	763	867	956	1036
146	245	342	434	488	578	678	764	869	957	1037
										1038
										1041
										1042
										1044

No. 19, ASSESSMENTS RECEIVED

TO JAN. 28, INCLUDED.

5	83	160	270	451	593	727	790	897	962	1036
6	88	162	276	453	595	728	791	899	963	1037
10	94	164	277	455	602	740	795	901	964	1038
16	97	166	288	457	620	741	797	907	965	1039
24	98	172	301	464	626	742	802	908	975	1042
30	101	175	317	476	632	743	803	915	976	1045
35	120	183	347	478	635	744	809	930	980	1048
42	131	185	351	481	646	749	820	931	986	1054
45	138	186	352	483	648	750	821	936	992	1060
46	141	187	353	485	662	751	823	939	994	1062
48	142	190	364	509	663	755	830	942	1000	1063
52	144	210	383	527	664	756	831	944	1002	
53	145	212	386	528	665	773	836	947	1008	
54	146	231	420	549	701	774	837	954	1010	
55	150	238	426	553	703	776	838	955	1011	
58	153	239	430	555	716	781	841	956	1015	
60	154	245	433	556	723	782	850	957	1017	
69	156	258	441	557	724	783	860	958	1018	
71	157	267	445	564	725	784	870	959	1019	
80	158	269	450	581	726	786	871	960	1020	

THE severest sleet storm perhaps ever experienced in America occurred January 13, in which hundreds of miles of wire, west of Toledo and Chicago, were wrecked. Great energy was shown in their restoration, 1,000 men being employed in restoring communication.

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NEW YORK, January 24, 1871.

MR. J. D. REID, ESQ.

DEAR SIR:—I have just received an error sheet addressed to me, as Manager of Long Branch, N. J., saying, "You check me 248." Signed, "What is it." Will you please inform me if "What is it" is the name of the Manager or the office. If it is the name of the Manager, where is his office? If it is the name of the office, what State is it in, as I cannot find "What is it" in the Tariff Book. Perhaps it is Barnum's "What is it" come to life again. Please answer soon as possible in your Answer to Correspondents, as I am anxious to end "What is it's" troubles.

Yours truly, J. MITCHELL,
290 Canal St., N. Y.

◆

The New Year has passed, but we want to preserve the following Address of the Messenger Boys of Milwaukee, Wisconsin:

Heard ye a sigh in the midnight!
Heard ye a sob on the wind,
As the Weaver worked at his great wheel,
And the thread broke as he spinned!

Did ye list to the icy branches,
Last night, how they cracked and groaned,
As sadly the wind swept through them,
And stopped at the window and moaned?

Last eve, as the sun cast its shadow,
Its shadows so long on the snow,
And the darkness came hastening after,
And the frost fell soft and slow.

Did ye note that a foot-fall softer,
A foot-fall slow but light,
Was falling abroad? and a bent form
Cast shadows on the night?

For the Old Year crept to his burial,
Which dated the midnight cold;
And the winds in the pines were sighing,
As the sad, sad news they told.

* * * * * *

To-night is the pivot and hinge of the years;
And men recount their joys and fears,
Rebuild their hopes, restock their doubts,
Gain vict'ries new, review old routs.

The year is alike to a mammoth chain
Of links that are welded again and again;
And, of the make of old Time's toy,
Something is known to the messenger boy.

Belting the land, and bedding the deep,
The wires are stretched, where the lightnings leap,
And, tamed to the service of man's desire,
Are bearing the news on their wings of fire.

We're servants of lightning, we messenger boys,
We've divided your woes, and measured your joys,
Have brought gold up, and sent stocks down,
Heralded war, and the fall of a crown.

We've been the watchers, while death has come
And robbed a jewel from palace home,
And while, in the mansion on the hill,
Gently a soul's tripped over the sill.

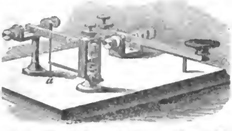
We've stood at a marriage, gone down to a grave,
Been rich as a Jew, and poor as a slave;
We've sat on a throne, and pegged on a bench,
Have spoke in the Senate, and worked in a trench.

In fact we have lived in all climates and grades,
Have been of all sizes, and sexes, and shades;
For you'll understand, that lightning employs
The wisest and wildest, most curious of boys.

To-night is the pivot and hinge of the years;
And we recount our joys and fears,
Rebuild our hopes, restock our doubts,
Gain vict'ries new, review old routs.

MECHANICAL TELEGRAPH INSTRUMENT,

PATENTED MAY 31st, 1870.



For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice to the various telegraph offices.

This instrument is an outgrowth of this pressing demand. The Inventor is himself a practical operator, now in active service. Operators and others wishing to teach or learn the Art, will be delighted with this instrument.

It can be placed anywhere, as it does not occupy a space more than six inches square. A card with the Telegraph Alphabet, Numerals, &c., attached to each Instrument.

Its cost is but $7, and there is no expense whatever to keep it constantly in working order.

Any person selling ten or more of the instruments, will be allowed ten per cent. commission, sent C. O. D., or on receipt of price.

To save expense of returning funds by express, remittance can be made by draft on Cleveland or Pittsburgh, or by Post Office Order, in which case no charge will be made for box. Price $7. Silver-plated, extra finish, $10.

Parties ordering instruments, e cept from well-known cities, will please give name, county and State.

Address, D. W. PUTT & CO.,
Wellsville, O.

D. W. Putt,
P. Brunen,
W. G. Brownson.

ATTENTION OPERATORS!

PAT. APPLIED FOR.

We would call your attention to our

TELEGRAPH OPERATORS' BADGE PIN.

Having completed our arrangements to manufacture, by putting in new machinery, and with a full force of workmen. We are now ready to supply the GREAT DEMAND for these Badge Pins. They are made of 18k gold, and are perfect fac-simile of the present Morse, or curved lever keys, and the new style Western Union straight lever and Fancy Base Keys. We are now making two different sizes, one to be three-quarters of an inch long, and the other one inch long. Also, a very small, neat, Badge Key Pin for Lady Operators. These are the only badge pins ever got up exclusively for Operators.

We are, also, manufacturing a complete set of Railroad Badge Pins, for Conductors, Baggage-Masters, Brakeman, Station Agents, and others, consisting of Punches, Passenger Cars (Pullman's Palace Pattern), Switch Targets, Coupon Tickets, &c. These Badges are all made of the most approved patterns.

PRICE LIST.

Key Pin, oval base, one inch long	$6 00
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Key Pin, fancy base, one inch long	7 00
Key Pin, fancy base, ¾ inch long	6 00
Key Pin, oval base, (for Lady Operators)	5 00
Key Pin, fancy base, (for Lady Operators)	6 00

☞ The above are made with straight or curved Levers. ☜

Conductor Punch Pin	$4 00
Passenger Car Pin (Pullman's Palace Pattern)	6 00
Switch Target Pin	4 00
Coupon Ticket Pin (enamel)	4 00

☞ The above are all made 10k gold (warranted). ☜

Persons ordering Key Pins, be particular in giving style of lever and base wanted.

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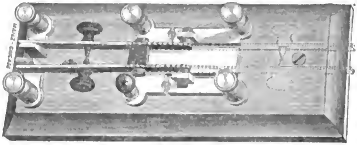

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A perfect, simple, homogeneous Self-Closing Key.—Journal of the Telegraph.

For full description and testimonial see Journal, Dec. 15, 1870. Liberal terms and arrangements will be made with the trade, telegraph companies and contractors. Sample keys now ready.

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Inventor and Patentee.

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For Telegraphing, Plating, Electrotyping and Experimenting.

To Telegraph Managers and Superintendents.

We are now making and keep on hand a style of

GALVANOMETER

for measuring resistances, which has the following merits:

1. It is designed especially to meet the wants of

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and operators, and for use on telegraph lines, having a range from a small fraction of

1 OHM TO 14,000,000 OHMS,

to measure either instruments, lines or insulation with equal convenience.

2. It is made on the

WHEATSTONE BALANCE

principle, which is the most

RELIABLE AND ACCURATE

method of measuring resistances, involving less liability to error than any other.

By this plan it is the resistance itself which is

MEASURED DIRECTLY,

and not some other thing from which the resistance has to be computed by a series of calculations. Its use is therefore

EASILY LEARNED

in a few minutes time.

3. It is

LIGHT AND PORTABLE,

the whole being contained in a small box which a man can easily take in one hand like a valise.

By our arrangement of connections and resistance coils a great range of measurements is obtained without the usual drawback of a cumbersome and heavy box.

4. To bring the instrument into general use we put the price at the low figure of $100, with $10 extra for an outside case and set of flexible cord connections.

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ELECTROTYPY.

This has taken a very important place among the useful arts, enabling manufacturers to produce cheaply a great many things which would otherwise be dear, and artisans to do many things which were otherwise impossible. The process is not a difficult one to comprehend. A galvanic current has the property, under certain conditions, of decomposing many chemical compounds. If the ends of two wires connected with a battery are inserted in a vessel of water, and a current of sufficient power made to pass from one to the other through the the water, the latter is decomposed into its elements, which are the gases hydrogen and oxygen. One gas will rise in bubbles from one wire-end, and the other from the other. These wire-ends are called electrodes. Many other substances, if dissolved in water, will decompose much more readily; as, for example, sulphate of copper, commonly known as blue vitriol. This is a compound of sulphuric acid and copper, and it takes much less power to separate the two than to resolve water into its component parts. As the current passes through the solution of blue vitriol the sulphuric acid appears at one electrode and the pure copper at the other. The sulphuric acid thus set free from its previous combination will at once attack its electrode if it be of any metal for which it has affinity. As the wires are generally copper, it, of course, produces new blue vitriol at the expense of the electrode which is thus eaten away. Meanwhile the other electrode is receiving continual accession of copper which is deposited upon it. If now there is attached to this wire a a cast of any kind, which it is desired to reproduce in copper, the metal is deposited upon it as long as the galvanic current is flowing and doing its work. A perfect copy, taking every minutest hair line, is thus obtained in pure copper; and if the surface of the cast or mould is properly protected, the copy may be readily removed after it is complete. The process might be continued until the deposit of copper should become indefinitely thick, but for economy and expense it is usually arrested when there is only a very thin layer, and into this a backing of soft metal is run in order to give stiffness. By this simple means anything may be copied with absolute accuracy, whether it be a seal, or a medal, or an engraved plate, or a leaf, or even a photographic negative; the one condition being that the picture or device depend on an unevenness of surface. Engraved plates, especially those of the great masters, are very costly, and yet after a certain number of proofs have been printed, lose by wearing much of their delicacy in the finest lines and touches. The first thousand impressions are far more valuable than any taken subsequently. The difficulty is now obviated by electrotypy, as the original plate coming from the hand of the artist need never be put under the printing press to lose its sharpness of outline. Copies can be taken indefinitely, and the originals of great works preserved for all time. So, also, by some newly discovered device, a printed engraving of which the plate is lost or ruined, may be used to reproduce a new plate as perfect as the original. Thus we have the means of restoring the best productions of the most celebrated masters at a reduced cost. A much more extensive application of this art is in the reproduction of printed matter in the permanent form of copper plates. Various metals may be deposited by the same method from suitable solutions—gold, silver, nickel, and platinum as well as copper. This gives a ready means for covering or plating inferior metals with the noble metals, which may be done to any desired thickness, as in a multitude of articles for domestic use.

Electrotypy affords an excellent employment for boys, combining entertainment with instruction and the development of skill. They can easily learn how to do it, if they are blessed with any aptitude, and it may lead them to deeper studies in chemistry greatly to their advantage, and to the exclusion of mischief-making.

◆

Fresh-blown Flowers in Winter.—Choose some of the most powerful buds of the flowers you would preserve, such as are latest in blowing, and ready to open; cut them off with a pair of scissors, leaving to each, if possible, a piece of the stem three inches long; cover the end of the stem immediately with sealing-wax, and when the buds are a little shrunk and wrinkled, wrap each of them up separately in a piece of paper, perfectly clean and dry, and lock them up in a dry box or drawer, and they will keep without corrupting. In winter, or any other time, when you would have the flowers blow, take the buds at night and cut off the end of the stem sealed with wax, and put the buds into water, wherein a little nitre or salt has been diffused; and the next day you will have the pleasure of seeing the buds open and expand themselves, and the flowers display their most lovely colors and breathe their agreeable odors.

◆

A Man entered the passenger room of the C. B. & Q. Depot at Summit, Knox Co., Ill., and hearing the telegraph instruments in the adjoining room, clicking pretty loudly, said, they are sending some pretty *heavy* dispatches now, don't you hear the wires roaring?

◆

THE MERCURIAL BATTERY OF MARIE DAVY.

This galvanic battery, which has lately been extensively, and almost exclusively, used in France, is not so universally known as it deserves. It is composed of zinc and carbon; but in place of diluted acid, the zinc is simply immersed in pure water, while the carbon is immersed in a paste of moistened sulphate of the oxide of mercury. The chemical action is similar to the Daniel battery, consisting of zinc, copper, and sulphate of copper. The zinc is oxidized at the expense of the water, which is decomposed, its oxygen combining with the zinc, forming oxide of zinc, while the hydrogen, in its nascent state, reduces the oxide of mercury, combining with the oxygen, forming water, and leaving the mercury in a metallic state. In this condition mercury cannot remain in combination with sulphuric acid. Hence the latter is also set free and combines with the oxide of zinc, forming sulphate of zinc; exactly as is the case in the Lowe, Daniel, and other batteries, while the metallic mercury collects at the bottom of the vessel. Such a battery may remain in operation for half a year, without cleaning or the addition of liquid. The current generated by 40 small elements has the same power as that from 60 of Daniel's larger ones, which lasted less than half the time.

As a modification of this battery, instead of the soluble sulphate of mercury, the insoluble sub-sulphate of the same metal may be used. When mercury is boiled with sulphuric acid, a portion of the acid is decomposed, in order to furnish oxygen for the oxidation of the mercury, which then combines with the remaining acid and forms a dry, neutral salt. When this is diluted with water, it is resolved, like many other salts, into two compounds; an acid sulphate, which is dissolved, and a basic sulphate, which is insoluble. The latter has a lemon-yellow color, and, being supposed to resemble closely in its medical effects the powdered root of a now obsolete plant, the *turpeth*, it was called the mineral turpeth.

For many years this substance had no practical value in arts, but now it will probably be extensively employed in galvanic batteries, for telegraphic and other purposes.—*Am. Artisan.*

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of various kinds, insulated with pure Gutta Percha, renders this arrangement a very important one for our numerous patrons throughout the country, and we confidently recommend these goods to their especial notice as being fully equal, if not superior, to any other in use.

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is now in operation in the following cities, to which reference is made for evidence of its great SUPERIORITY AND VALUE, and UNIFORM reliability:

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are a Combination of Circuits, the Automatic Signal Boxes, Electro-Mechanical Bell and Gong Strikers.

THE AMERICAN FIRE ALARM AND POLICE TELEGRAPH is covered by some twenty patents. Very early after its introduction into Boston, GAMEWELL & Co. purchased the original patents of FARMER & CHANNING, and during the past fifteen years have spared no expense or pains to improve and perfect this system.

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The attention of Telegraph Companies and Builders is invited to the Compound Steel and Copper Wire manufactured by the

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is but about one-third that of an equivalent conductor of iron, and its conducting capacity may be largely increased with but slight increase of weight. In consequence of this lightness, together with its

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but one-third of the number of poles are necessary that are required in iron wire construction, thus largely improving the Insulation and combining Economy in Construction and Reconstruction, with superiority in working.

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JOULE AND SCORESBY'S EXPERIMENTS ON THE MECHANICAL POWERS OF ELECTRO-MAGNETISM, STEAM & HORSES.

By the Rev. H. Highton, M. A.

Some weeks ago I promised an examination of Jacobi's paper on "Electro-Dynamic Engines," in *Ann. de Chim. et de Phys.*, vol. xxxviii.; I have not lost sight of the matter, but think it as well to examine first Joule and Scoresby's experiments as given in the *Philosophical Journal* [3], xxviii.

Let me say how exceedingly valuable I consider Joule's experiments generally, and how fully I appreciate his title to the honors that have been bestowed upon him; but, at the same time, though his experiments are exceedingly valuable for the legitimate conclusions which may be drawn from them, yet I consider that the deduction, that heat has a definite mechanical equivalent, and that the admission of the supposed axiom of conservation of energy as applied to electricity and heat as well as mechanics, or rather to electricity and heat as connected with mechanics, has done great mischief in a scientific point of view, and thrown back the progress of the science of electro-dynamics for many years.

The paper I now propose to examine contains in itself a sufficient refutation of these views; and it appears astonishing that it should have been allowed for so long to be quoted as a reliable authority in support of them.

Let me first give a brief description of their experiments. They first fixed strong permanent magnets; they next formed electro-magnets which, by means of commutators and the aid of a galvanic battery, rotated in front of the permanent magnets; by this rotation, through the medium of proper machinery, they raised weights. They measured and compared the intensities of the current and the consumption of zinc, when the engine was at rest and when it was at work, and compared the work done with the zinc consumed. So far, there is nothing to object to; it is their reasonings on the facts, and the mathematical formulæ which they introduce, which, to my mind, require nothing but an examination to show how hopelessly wrong is the theory of a definite mechanical equivalent of heat. They begin by asserting that as the heat evolved in a circuit is (*cæteris paribus*) as the square of the intensities; therefore if a and b represent respectively the intensity (and, consequently, the consumption of zinc) when the engine is at rest and when it does work, the heat evolved in the two cases will be as a^2 to b^2; but as this is not a case of *cæteris paribus*, there seems no reason why this statement is introduced, or what bearing it has on their experiments; and no use is made afterwards of this assumption, but they estimate in the sequel the heat produced by the quantity of zinc consumed. But Messrs Joule and Scoresby's next computation is the one I wish particularly to draw attention to, as nothing can better show how utterly untenable are their views of the subject. They say that "the quantities of zinc consumed" (that is, respectively, when the engine is at rest and doing work) "being as a to b $(a-b)$ represents the quantity of heat converted by the engine into useful mechanical effect." Therefore, since on the supposition of a mechanical equivalent of heat a grain of zinc consumed equals 158 foot-pounds, if $x =$ pounds raised a foot high per consumption of a grain of zinc in the battery,—

$$x=\frac{(a-b)158}{a}$$

Hence the authors draw the conclusion: "Therefore, when b vanishes, or becomes infinitesimally small, the economical duty is a maximum."

Certainly this is a most startling result; that the maximum of work should be done when no zinc at all is consumed! But it is quite evident that the authors assumed, and framed their equation on the assumption, that the battery produced the same amount of heat, whatever quantity of zinc was consumed; but that part of the heat was absorbed and disappeared in doing work. But I need hardly say that this assumption is entirely erroneous, that the only possible source of heat could be the consumption of zinc, and that when the zinc consumed fell from 500 to 200 grains per hour, the difference of heat corresponding to the two quantities could not be absorbed or disappear, because it never was produced at all. It is really difficult to imagine how conclusions based on such a formula and on such a theory would ever have been accepted. I am sure it is only necessary to call attention to it in order that the error should be recognized. I can scarcely help imagining that I must have misunderstood the authors' meaning; but I really cannot see how the equation or their statements will bear any other interpretation. Seeing, then, that this was the formula on which their calculations were based, no wonder if the results were not according to their calculations. In their first experiment they calculated that 92·9 pounds should be raised a foot per grain of zinc consumed; 102·9 were actually raised. In their second they calculated 97·8; the result was 98·8. When, according to the theory, the duty should have been less, it was actually more. The only wonder is (and it can have been due to little more than accident) that the agreement was anything nearly as great as what it is. They attributed the excess of performance over calculation to the fact that the acid of the battery was rather warm, and that, therefore, the battery produced greater intensity of current. But they forgot that if it produced greater intensity of current more zinc would be consumed, so that this would make no difference to the duty of a grain of zinc. I pass over their other experiments; for, inasmuch as in these they substituted for the electro-magnets used in the first experiments less powerful and less skilfully constructed ones, no wonder if they reduced the results to 34 foot-pounds per grain of zinc. They might in the same way have reduced the economical effect to any extent. But after having thus reduced the economical duty of a grain of zinc by badly constructed electro-magnets, it is very unfair to strike a kind of average, and to say that the *maximum* practical power of a grain of zinc is 80 foot-pounds, whereas they had themselves got 102·9 foot-pounds.

Well, now let us look at the general result of the real facts. They calculate the maximum theoretical power of a grain of zinc to be 158 foot-pounds, and yet, using permanent magnets, which, by their own statement, were so badly constructed as to have only a quarter the power they ought to have had, with the poles of the electro-magnets never approaching the permanent magnets nearer than $\frac{3}{4}$ of an inch (and what an enormous loss is incurred here!); with an engine constructed almost at hap-hazard, and with scarcely a consideration of the best principles or of the most advantageous construction of such engines, they actually obtained a result of 102·9 foot-pounds out of a calculated theoretical maximum of 158. With a little care and consideration, I do not hesitate to say the duty per grain of zinc might easily have been increased ten-fold.

Now contrast this with what they tell us of the performances of a steam engine. The best steam engine, according to their accounts, produces only about one-tenth of the theoretical duty of the mechanical equivalent of the coal consumed; and a horse only about a quarter of the theoretical duty of the hay and oates which he consumes, and yet in an electro-dynamic engine constructed at hap-hazard, without any definite principles or calculation of economy, about two-thirds of the maximum theoretical duty is at once secured.

I conclude, then, that these experiments, instead of being supposed to have confirmed, should at once have shown the falsity of the theorem of a definite mechanical equivalent of heat or chemical change.

PUTNEY, January 7, 1871.

P. S.—I find that in a letter, a few weeks ago, on the question of whether a magnet, in contact with a piece of soft iron, produces a pole of an opposite name or of the same name only. I did an injustice to Professor Tyndall in assigning the first correction of the mistake to Du Moncel, in 1858. Tyndall pointed out the error in 1851, and says he finds that Poggendorff and Van Rees had both also made the same observation. Is it not strange that now for twenty years all our text-books (as far as I know) go on repeating the error? H. H.

London Chemical News.

◆

MAGNETIC DEVELOPMENTS.

To the Editor of the Journal of the Telegraph.

No. 4 of the JOURNAL copies from the *Technologist* an attempted refutation by its editor of a proposition made by Rev. Mr. Highton, in a paper read before the British Association, on the "Maximum of Magnetic Power evolved by a Galvanic Battery." The proposition quoted by the editor, Prof. Phin, as his text, is substantially that "the magnetic power evolved by a given battery can be increased without limit by simply increasing the length and section of the wire."

Now, in my opinion, Prof. Phin does not meet the question at all, beccuse he omits to consider, or seems to forget, that the *section* of the wire is to be increased at the same time and in a corresponding ratio that its length is; so that his whole article only argues that power may not be indefinitely increased by increasing the length alone—a proposition entirely different to the one he promises to disprove.

I believe this question may be set at rest by a very simple and easily performed experiment. Let us see. Take a given battery of one element, or of any number of elements, the total internal resistance of which is known; then take a wire of any length and section, whose resistance measures the same as that of the battery. We then have an equality between the internal and the external resistances; and, according to the law correctly stated by Prof. Phin, the most effective strength of the battery (in chemical units) circulating in the wire, when it ie lecluded in the circuit. Next, select a wire of considerably greater length *and* section, but of exactly the same resistance as the other. Of course, the battery will evolve the same current strength whichever of the wires is separately connected up in circuit. Now, the question for us to settle is, whether any given equal length of the two wires has the same magnetic power. To determine this point, apply, first, one of the wires, and then the other, over the face of a pocket compass, parallel to the needle. *The needle will be found to be equally deflected by the two wires*, showing that equal lengths of the two wires have equal magnetic power. Suppose, then, that the wires are respectively 100 and 300 feet in length, and that the length of each which produced the deflection of the needle is 2 inches: it follows that the magnetic power residing in the whole length of the wires is, in one case, $\frac{100\times 12}{2} = 600$, and in the other, $\frac{300\times 12}{2} = 1800$, calling the current which produced the deflection unity.

Then, is not Mr. Highton's question, "whether facts, and the ordinary accepted laws based on facts, do not show that a given amount of chemical change [current strength] can, by skill, be made to produce any amount of force whatever," answered in the affirmative?

DYNAMICA.

POSTAL TELEGRAPH.

WE copy, on account of valuable statistics therein, a portion of the memorial of Gardiner G. Hubbard to Congress, on the subject of postal telegraph system. We omit the portion having reference to England as being already sufficiently familiar:

NORTH GERMAN TELEGRAPHIC UNION.

The North German Telegraphic system comprises the states of Prussin, Schleswig-Holstein, Saxony, Hanovrr, Cassell, Weisbaden, and several small states.

The rates depend upon the distance, and have been reduced at different times in the belief that lower rates would increase the business, give full employment to the lines and offices, and prove as remunerative as higher rates and less business. These reductions have increased the number of family messages much more than the commercial.

The business is divided into four classes, with special wires for each class.

The first class comprises the international traffic, and has 96 wires. The second class, the greater internal traffic with 97 wires. The third class, the lesser internal traffic, with 285 wires. The fourth class, the lines for the local traffic, or *omnibus-leitungen*, with 490 wires; about 50,000 miles of wire in all.

Wires set apart for one kind of business are not used for any other. The largest wire is twice the size of the smallest. Smaller wires were used formerly for the international and long traffic, and difficulty in transmission was experienced in bad weather; but now there is no trouble, except occasionally on the Baltic and Black Sea lines. There are 120 to 130 poles to the German, or about 28 to the English mile, and an average of 4 wires to the pole. There is little difficulty from cross-currents. The wires are on alternate sides; those on the same side being directly over each other, and 18 inches apart. The Hughes Printer transmits easily 150 German, or 700 English miles, with automatic repeaters when necessary.

The operators are all paid the same salary, and receive also a bonus of 1¼ groschens, or one cent on each message sent or received.

An automatic instrument for printing the Morse character, the invention of Messrs. Siemaes and Halské, is used on the Prussian lines. The words are punched on a strip of paper, then sent by a transmitter, and received on the ordinary Morse register. This instrument has been in operation more than a year, and it is claimed that it works about twice as fast as the ordinary printers, is less likely to get out of order, is more easily repaired, and repeats automatically. Another instrument, invented by Mr. Gustav Jaite, has been recently introduced on the lines between Berlin and St. Petersburg, which, thus far, has fully equaled the expectations of the inventor.

The state pays for the right of way and transportation of materials over private railroads, and permits them to string one or more wires on the poles, for railroad business only, and when these are out of repair, to nse the government wires.

There is little business done between distant points in North Germany, as the business of each city is chiefly confined to its own immediate neighborhood. Berlin, Hamburg, Bremen, and Frankfort, are the only exceptions to this rule.

BELGIUM.

The telegraph, post, and with a few exceptions, the railroads of Belgium, are owned by the state. They belong to the department of public works, and each forms a section, under the charge of an engineer-in-chief. Every railroad company is obliged by its charter to give a right of way to the telegraph, furnish free transport of men and materials, and send and deliver all telegrams for the public from stations where there is no government telegraph office; in return, all their service telegrams are sent free to all parts of Belgium; they are allowed to put their wires on the government poles, and on lines where there is but little business, to connect their instruments with the state wires. The railroad telegraph operators receive a bounty of 30 centimes for each telegram transmitted, and 20 for each one received. Regular operators are paid a small annual salary, and receive in addition a commission on each telegram sent. They are fined for every error and for each telegram delayed or missent. These commissions and fiees are settled semi-annually. The regular day's work is eight hours, but in offices where there is little business it is ten. There is no press of business at one hour of the day more than another, but the work is nearly uniform from 10 A. M. to 7 P. M. All the telegraph offices, excepting in one or two of the larger cities, are either in the post office or at railroad stations. There are offices at the exchanges in Antwerp and Ghent, but none in Brussels. Only five per cent. of the business relates to money or brokerage transactions. Several years ago a custom was introduced of registering telegrams, which there are entitled to priority of transmission, and amount to about nine per cent. of the whole. Dr. Vinchent said the plan gave general satisfaction, and should be generally introduced. The large reduction in rates has been of much greater advantage to the people than to the business community, for the former could not afford to use the telegraph at high rates, while the latter were obliged to use it, and regulated their business expenses accordingly.

Stamped paper for messages is sold at its stamped value, and is much used. Answers can be prepaid, and stamps for the amount are delivered with the telegram, and can be used or cashed at any time. Messages insufficiently stamped are forwarded, and the deficiency collected, with a small fine in addition. Telegrams are received in boxes placed in street cars and omnibuses, and collected at the end of the ronte. These boxes are used mnch more than the street letter-boxes. There are also bureaus of deposits in the large cities, where telegrams are received and collected. Ninety-four per cent. of inland telegrams are under twenty words. The business is very evenly distributed over the whole line of wires, yet out of the 438 offices now open, 160 sent on an average, last year, only four messages a week—altogether about 23,000 for the year.

RATES.

The rates on the continent for messages of twenty words, including address and signature, vary with the distance; for inland telegrams, transmitted short distances of about fifty miles, they range from 10 to 20 cents, averaging 12½ cents; for distances of about one hundred miles, they average 20 cents; for two hundred miles, 37½ cents; and for seven hundred miles, 70 cents. These are approximate estimates.

The annexed Table A gives accurate statements of the rates in several countries. The charges for inland messages are invariably lower than for international or transit ones, and though the rates for the first have been greatly redneced within a few years, the latter have generally remained unchanged. In several of the small states there is a uniform rate, but as the average distance of transmission does not exceed fifty miles, the rate is practically no lower than in other countries.

In Great Britain the message is twenty words, exclusive of address and signature, and the rate is uniform—one shilling—twenty-five cents. The average distance of transmission is about one hundred and fifty miles. Cork is the most distant from London of the large cities—four hundred and fifty miles. The rates from London to the principal continental cities average about $1 50.

There is a loss on all telegrams on which less than 15 cents is paid; the deficiency is made up on the international and transit messages, and is a tax imposed on foreigners and citizens trading with other countries. Every large reduction of inland rates has been followed by a great increase of business, and has been beneficial to the public; but a careful examination of the European statistics shows that very low rates do not pay expenses.

Belgium was the first country to make these reductioes, and the telegraph is used there more extensively than in any other country. The minister of public works, in his report for 1869, concludes a review of the Belgian system as follows:

"As a resumé, under the form of propositions, of the results of the experience which we have here analyzed, we may regard it as demonstrated—

"1. That a reduction of the telegraphic tariff brings a diminution of the net profits, even under the most advantageous conditions ever known.

"2. That the interior service, already in arrears from the past reduction of tariff, has obtained by these measures an enormous increase of the correspondence, with a small increase of deficit."

Dr. Vinchent, the engineer-in-chief, says: "It is a delusion to attribute to uniform and very low rates an increase of the net profits. My testimony may be deemed impartial, because it has been upon my proposition, and almost always by my initiative, that our tariffs have been reduced."

All the gentlemen consulted on the subject thought the adoption of a uniform rate in the United States must result disastrously. Dr. Vinchent believed it would have been better to have had more than one rate in Great Britain, and that three or four would be needed here. The postage is uniform, because the benefit is relatively the same, for the time of transmission by mail is proportioned to the distance; but with the telegraph distance is an unknown quantity, and the only advantage of the telegraph over the mail is in the gain of time; this is proportionate to the distance. It is unjust, therefore, to make those who have but a short distance to send, pay as much as those who send long distances and receive a much greater benefit.

Mr. Elsasser, private councillor of Prussia, said that the rates in Germany were made relative to the distance, because not only did the benefit increase with the distance, but the expense also, as one or two repetitions were generally required on long distances.

Mr. Scudamore says: "The advantages of a uniform rate are very great, and in Great Britain outweigh all the disadvantages; but these disadvantages increase with the size of the country. When we were preparing our scheme we were much pressed from all quarters to adopt a sixpenny instead of a shilling rate. This we resisted, and urged that until we knew what the wires would do, we ought not to go so low. The shilling rate brought so large an increase of business as nearly to swamp us at the outset, and then people forgot their demand for a sixpenny rate, and blamed us for beginning with a shilling. In the course of time we shall be ready for a sixpenny rate, but then it must be for ten words only; there is no need to put the minimum number of words, exclusive of address, so high as twenty."

Mr. Baines, of the English post office, said that while a shilling rate worked well with them, it would be too low for the great distances in America. The rates should depend upon the distance, for the gain over the mail would be so great that with a low rate, there would be such a great increase of business as to render it impossible to transmit the messages promptly.

There is no country where the public interests are more carefully watched and greater economy practised than in Prussia. The average cost of each message there is 26$\frac{4}{10}$ cents. This is much less than it would be in this country, where the average distance of transmission is much greater and wages are higher.

The Belgian and English statistics show that the increase or reduction of rates affects certain kinds of business less than others. The international and transit rates between Belgium and foreign countries have been reduced in a series of years with "a development of correspondence, much loss, and a diminution of the profits (*benefice*) much greater than the increase of the deficit from inland messages," and this reduction of profits tends continually to increase.

The rates for messages between different parts of London was raised in February, 1870, from sixpence to one shilling, yet the business increased in consequence of the greater facilities afforded under the present system.

The telegraphic correspondence of brokers and of other special classes of business is stimulated more by quick transmission and peculiar facilities than by low rates, and would be increased but little by a reduction of rates, while the loss of revenue from that source would be very large. All other kinds of business would be largely increased by reduction of rates.

TRANSMITTING INSTRUMENTS.

The value of the telegraph depends in great measure upon the rapidity of transmission. This is affected by the size of the wire, the character of the insulation, the kind of transmitter and the skill of the operator; and as the number of electric pulsations that can be transmitted over a wire in an hour is almost unlimited, many inventions have been made to increase the rapidity of transmission, and great interest is felt upon this subject among telegraphers.

The Morse transmitter is the instrument in most general use in every country. It is cheap, little liable to injury from hard usage, quickly repaired, and works more easily under all circumstances than any other. But while it possesses all these advantages, its usual working speed in this country is limited to about 1,000 words an hour for distances not exceeding 500 miles. With repeaters, and at a lower rate of speed, it works readily between Chicago and San Francisco, a single circuit of 2,500 miles. In America, messages sent by the Morse instrument are received by the ear from the sounder, but abroad they are taken from the register on strips of paper.

The combination printer of Mr. Phelps, used in this country, transmits 2,500 words an hour on a circuit of 250 miles, and has transmitted over 3,800 words per hour between New York and Washington.

Next to the Morse, the Hughes printer is the favorite instrument on the Continent, and on the long circuits, where there is a large business, is always used.

In the North German Union there are 2,352 Morse, 65 Hughes, and 4 other instruments; the Morse transmitting from 15 to 20 messages, about 400 words, an hour—highest speed, 30 messages; and the printer twice as many, transmitting readily and very distinctly over 600 miles.

In France, 2,850 Morse, 1,650 Cadran (dial), 250 Hughes, and 17 Meyer instruments are in use. The last is an automatic instrument, transmitting the *fac simile* of the writing; it is generally used for money transactions. The tariff of prices is regulated by the size of the paper on which the message is written; three francs for a piece of paper 1$\frac{1}{3}$ by 3 inches. Thirty messages an hour can be sent by this instrument; but it is only used in France. The average number of messages transmitted in an hour by the Hughes apparatus is 50; by the Morse, 20; by the dial, 15.

In Switzerland, 708 Morse and 18 Hughes instruments are used, and 20 messages by the Morse instrument is considered a very large number for one hour's work.

In Belgium there are 694 Morse, 82 Cadran, and 15 Hughes; 15 to 20 messages an hour are sent by the Morse, 30 to 40 by the Hughes.

In England a variety of instruments are in use, principally the single-needle, bell, and Morse. The Hughes printer and Wheatstone automatic are on a few of the main circuits. This last has been recently introduced, and is the favorite instrument on long circuits where there is a large business. Daily returns are kept of the number of telegrams sent by every instrument, at the central office, London. The average number of telegrams sent between 12 and 2 o'clock, when the business is most pressing, was 29 messages, or 1,000 words, by the Morse; 50 messages, or 1,400 words, by the Hughes; and 104 messages, or 3,640 words, by the Wheatstone. The average length, including service, was said to be 35 words. The average number of messages per hour for the whole time recorded was—Morse, 27; Hughes, 42; Wheatstone, 97. Number of words—Morse, 969; Hughes, 1,478; Wheatstone, 3,412.

It thus appears that on the Continent an operator transmits with a Morse instrument less than half as many words an hour as the English and American operator; that the Hughes printer works slower than the Phelps combination, while the latter falls far below the Wheatstone. The Wheatsone instruments were working at different rates of speed—one to Dublin, 328 miles, including a cable 60 miles long, at the rate of 3,900 words an hour; another to Glasgow, at the rate of 7,000 words an hour; while another was transmitting press news from London to Bristol, thence by relays to Exeter and Plymouth on one line, and Gloster, Newport, and Cardiff on another, at the rate of 2,000 words an hour, its speed being limited by the working capacity of a Morse relay at Bristol.

As this instrument appeared to solve the question of cheap telegraphy, it was very carefully examined to ascertain the difficulties and expenses of operating it. It requires two punches and a transmitter at one end, one receiver and two copyists at the other: also four punching, two transmitting, and two recording instruments. The message is prepared for transmission by passing a strip of paper through a puncher worked by three keys. The first punches three holes in the paper, one above the other: ⁝ ⁝ ⁝ ⁝ the second, a row of horizontal holes: . . . . the third, three holes, diagonally above each other: ⋰ ⋰ ⋰ ⋰ This paper is fed or pushed along by the middle row of holes made by the puncher. The other holes represent the dot and dash of the Morse alphabet. It was said that forty words a minute could be punched. The average, according to the number of messages transmitted, is thirty. After the paper is punched, it passes to the transmitter, where the contact is made by a very ingenious mechanism, and the message is received at the other end of the circuit on an ordinary Morse register. The instrument is worked on the Morse system, with alternate positive and negative currents. The first cost is much greater than that of the Morse instrument, and the operating expenses are three or four times as much, as it is more liable to get out of order, and can be profitably used only on long circuits where there is a large business. No place could afford to rely solely on this instrument, as it is not yet perfected, nor its pathology fully understood. When it fails, the results are more disastrous than with a Morse instrument, because so many more telegrams are thrown in arrears. Every error made by fast instruments of all kinds tends to exaggerate the mistake when recorded. An interruption of ten seconds with a Morse instrument would cause a loss of but four words, which the receiver could ordinarily supply; but with the Wheatstone, ten words would be lost, and could not be supplied, and the message would have to be repeated. Yet, with all its defects, it was the favorite instrument in the operating room, and is rapidly coming into general use. Only seven were at work six months ago; now there are thirteen or fourteen, and more have been ordered. The Wheatstone is invaluable as an auxiliary to the Morse, but as a substitute valueless.

There are no automatic instruments in operation in this country, although a line has been recently constructed between Washington and New York, by Mr. Craig and others, on which an automatic instrument of Mr. Little will be used. The message is received on paper, chemically prepared, which presents difficulties not experienced by the Wheatstone.

MORSE TESTIMONIAL FUND.

RECEIVED SINCE LAST ISSUE.

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This amount is contributed by Maj. John D. Adams, a citizen of Memphis, and owner of the Memphis and Arkansas Packet Co. lines—a gentleman well known for his noble qualities, enterprise and liberality.

Very respectfully, yours, J. COLEMAN, Supt.

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J. E. Adam, clerk	1 00	W. J. Landy, opr	1 00
A. English, clerk	1 00	T. F. Blanchard, opr	1 00
J. L. Adam, clerk	1 00	Herman E. Grant, opr	1 00
M. P. Walsh, clerk	1 00	J. W. McDonald, opr	1 00
C. H. Haight, clerk	1 00	Jno. L. Jones, opr.	1 00
R. B. Dillon, clerk	1 00	C. D. Thomas, opr	1 00
G. M. Nugent, clerk	1 00	John Mathews, bat'man	1 00
Simon Fitzpatrick, clerk	1 00	Will Frazer, agt. C.N.D.	1 00
Thomas E. Graham, clerk	1 00	J. E. McDaniel "	1 00
James J. Kearns, clerk.	1 00	W. Cummings, operator, Poydras St.	1 00
E. W. Sewell, clerk	00		
Thad. D. Alleyn, clerk	1 00	J. A. Smith, opr., Levee	1 00
W. D. Keron, clerk	1 00	Thomas J. Fitzgerald, msr	50
Jos. J. Keating, clerk	1 00	James Kelly, messenger	50
John J. Gardner, clerk	1 00	James Rankin, messr.	50
William Hill, messenger	50	John Brooks, messr.	50
Robert Nugent, mes'ger	50	Thomas McCann, messr.	50
E. J. Davis, messenger	50	Alex. Harding, messr.	50
Thomas P. Gardner, msgr	50	Henry Brimm, porter	50

New Orleans Sub	$54 00
P. J. Hader, operator, Algiers, La	1 00
R. H. Yelverton, operator, Americus, Miss.	1 00
Phil. Delgado, Brickley, Miss	1 00
E. Von Eye, operator, Fort Pike, La	1 00
J. Molony, operator, Fort Macomb, La	1 00
W. T. Bush, operator, Franklin, La	1 00
J. T. Davidson, operator, Gainesville, Miss	1 00
J. D'Echaux, operator, Lake Charles, La	1 00
A. P. Wark, operator, Lake Charles, La	1 00
W. F. D. Meehan, operator, Mermenteau, La	1 00
John H. Meehan, operator, New Iberia, La.	1 00
"The Baby," New Iberia, La	1 00
Tim. Driscoll, repairer, New Iberia, La	1 00
Aladin Vincent, operator, Sassafras, La	1 00
G. W. Selman, operator, Vermillion, La	1 00
J. J. Davidson, operator, Wolf River, Miss	1 00
E. C. McLellan, operator, Brashear, La	2 00
P. King, repairer, Brashear, La	1 00
William Moake, repairer, New Orleans	1 00
Jerry King, foreman repairs	1 00
	$75 00

Money not received, but for which we credit the parties. Losses of this kind are very vexatious.

L. C. Orvis, Manchester, Vt. (2d sub.)	$1 00
Clark J. Wait, Manchester, Vt. (1st sub.)	1 00

MAINE ONCE MORE.

Mrs. A. C. Walker, manager, Rockland, Me	$3 00
Eugene M. Dow, messenger, Rockland, Me	50
Charles C. Benson, manager, Lewiston, Me	2 00
A. W. Benson, manager, Kendall's Mills, Me	1 00
Miss Jennie C. Flood, manager, Clinton, Me	1 00
Miss Carrie Caine, manager, Kennebunk Depot, Me.	1 00
D. E. Estabrook, manager, Camden, Me	1 00
E. R. Seveno, manager, Skowhegan, Me	1 00
Andrew Smith (2d sub.), manager, No. Andover, Mass	1 00
Miss Sarah M. Eldred, manager, Belgrade, Me	1 00
H. W. Wheeler, manager, Brunswick, Me	1 00
G. A. Carter, manager, Saco, Me	1 00
Wm. Corey, manager, Winthrop, Me	1 00
Miss C. P. Edwards, manager, Monmouth, Me	1 00
"Vis," manager, Damariscotta, Me	1 00
M. L. Wright, manager, Wiscasset, Me	1 00
B. D. Farnham, manager, Sabattus, Me	1 00
Charles H. Leavitt, manager, Exeter, N. H	1 00
Miss M. A. Watson, manager, Exeter, N. H	1 00
Fannie M. Clark, manager, Reading, Mass	1 00
Chas. H. Gilmore, Jr., manager, Newmarket Junc., N. H.	1 00
Geo. Edward Merrill, Newburyport, Mass	50
G. J. Robinson, manager, Thomaston, Me	2 00
C. C. Bedlow, supt's office, Portland, Me	2 00
C. D. Livermore, manager, Portland, Me. (2d sub.)	2 00
Unknown, manager	1 00
	$31 00

The above are additional subscriptions from this district. *More coming soon.* Yours, CHAS. D. LIVERMORE.

TOLEDO, WABASH AND WESTERN R. R.

DEAR SIR:—Enclosed find P. O. order for $17 75, an additional subscription from a few of the Wabash boys.

Yours, W. T. BODLEY.

W. T. Bodley, clerk superintendent's office, Toledo.	$1 00*
J. H. Boyle, train despatcher	1 00*
C. F. Reale, train despatcher	1 00*
R. B. Hubbell, operator	1 00*
W. D. Hall, operator	1 00*
James Wright, messenger	25*
G. T. Squire, operator, Maumee, O.	1 00*
T. H. Harrington, operator, Maumee, O.	1 00
D. R. Cummings, operator, Maumee, O.	1 00
S. Van Rensselaer, student, Maumee, O.	50*
Geo. E. Utley, operator, Maumee, O	50*
E. F. Coulter, operator, Whitehouse, O	1 00
H. C. Talbot, operator, Whitehouse, O.	1 00
C. H. Newell, operator, Newhaven, Ind	1 00
E. Whitaker, operator, Newhaven, Ind	50
G. A. Beach, superintendent telegraph, Toledo	5 00*
*Second subscription.	$17 75

FREDERICSBURG, VA.

J. G. Thweatt	$1 00
F. D. Cudlipp	1 00

John W. Ley sent us a gold dollar for his little son, but it vanished before it reached us. We credit him.

John W. Ley, Orange, N. J., for his son, 1 gold dollar	$1 00
1 greenback	1 00

ASHTABULA, OHIO.

J. M. Allen, manager W. U. Tel	$1 00
S. W. Allan, messenger	25
Mrs. J. M. Allan	25
A. F. Hubbard	50
George Willard	50
H. H. Hall, manager A. & P. Tel	1 00
Every little helps. That's so.	$3 50

GRANVILLE, OHIO.

DEAR SIR: Hope we are not too late. Inclosed please find $5 50. Yours, C. W. BLACK.

A. P. Prichard, manager	$2 00
Will. W. Prichard, ex-manager	2 00
C. W. Black, operator	1 00
Will. M. Ralston, student	50
	$5 50

MARIETTA, OHIO.

W. W. Lucas, R. R. agent	$1 00
Joseph Harris, operator	1 00
E. A. Crewson, operator	1 00
W. C. Gurley, operator	1 00
A. S. Tibbetts, messenger	50
H. G. Lucas, manager	1 00
	$5 50

We are advised of the following having been mailed to us, but which, we regret, have not been received. Yet the credit is due and is given.

Miss S. M. Doane, operator, Saybrook, Conn	$1 00
E. M. Lynde, operator, Saybrook, Conn	1 00

MIDDLETOWN AND MIDDLEFIELD, CONN.

M. J. Long, operator, Middletown	$1 00
M. T. Kennedy, operator, Middletown	1 00
James Reeder, messenger	50
Johnnie Clark, messenger	50
Lyman A. Willis, operator, Middlefield	1 00
E. G. Sherman, operator	1 00
W. P. Richardson, operator	1 00
	$6 00

PNEUMATIC TUBES.

For a number of years past, the telegraph offices of London have communicated with a central office, and consequently with each other, by means of pneumatic tubes. There are now in use fifteen of these, in which "carriers" containing the messages are transmitted by atmospheric pressure. This is done by exhausting the air in front of the carrier, and providing an air-blast behind. The germ of the system is found in a tubular way laid down and for some time in use near Brighton, England, at the beginning of the present century, and through which carriages were propelled by creating a partial vacuum in front of them. From this crude beginning the method has been brought to a very high degree of utility, as shown by the number of pneumatic tubes in operation, not only as just mentioned in London, but also in Liverpool and Manchester.

The success of the system for transmitting written messages and such light articles seems to be due mainly to the use of "circuits," or, in other words, by making the tube, carried through the stations, to and from which messages are to be sent, return to the central station, so that the air-current, while traversing continually in one direction, is enabled to convey the carriers from the central station at one end portion of the tube, and to it at the other. The means by which the carriers designed for the stations along the line may be taken out without interfering with others *in transitu* is ingenious. At each station the tube is intersected by a receiving apparatus, consisting of two short barrels having the same diameter as the tube itself, and working on an axis parallel with that of the tube, in such a manner that either of the barrels may be brought in line therewith. One of the barrels is open at both ends, so that, when adjusted in line with the tube, as just mentioned, the carrier may pass through it without hindrance; whereas the other barrel has only a small perforation, for the escape of air, in its forward end, and when in position intercepts and receives the carrier. The latter is removed from the receiver by turning this last to bring the open-ended barrel continuous with the tube, which movement, by bringing the receiving barrel out of line with the tube, permits the removal of its contents. The time at which the carrier will reach the receiver is indicated to the attendant by a telegraph signal.

We have not space for mention of the numerous details which, very thoroughly worked out, have added very materially to the efficiency of the system, and, indeed, brought it to a point of perfection that furnishes a strong argument in favor of its adoption on this side of the ocean. We notice, however, one suggestion concerning it in an English journal, strangely at variance with the practical character of the scheme as now in use. We allude to the idea of substituting hydrogen gas in the place of air in the tubes, the fallacy of which should be evident to any one who has witnessed the school-boy experiment of letting his gas leak through the most minute crack in a glass bottle.—*American Artisan.*

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TELEGRAPHY IN THE ARGENTINE REPUBLIC.—An official report shows that in May, 1870, there were 836 miles of telegraph in actual operation in the Argentine Republic, while 1,000 miles more were in course of construction. Wires are being carried across the Andes to Chili, and a connection is also to be established with Brazilian and other lines.

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AT Digne, in Germany, several butts of wine were shattered by lightning, and their contents passed along the floor into a cistern beneath. It was found that, far from having suffered by the accident, the wine was improved so as to sell at 60 instead of 10 cents per litre. Subsequent experiments tend to show that a current caused by the immersion of two platina electrodes in connection with a galvanic battery have a similar effect on wine. Even poor wines seem to assume an agreeable flavor through the process.—*Food Journal.*

CONSOLIDATION OF CABLE COMPANIES.

A correspondent of the N. Y. *Herald* writes:

A cable bill from the House of Representatives has been reported to the Senate by the chairman of the Committee on Foreign Relations, with an amendment making it unlawful for two or more cable companies to consolidate or unite their interests. This amendment, if adopted, would seem to be a direct attack upon an important interest, intimately connected with commerce, and damaging to the productive interest of the United States. If the proposed law could be extended to other portions of the world besides that of the United States it would be most unwise, because it would in effect increase the cost of transmission; but to shut up the United States and leave the balance of the world free to consolidate telegraph lines or make a union of interest, and thus largely reduce the cost by a reduction of expenses, is giving to the world commercially great advantages over the United States. This fact can be illustrated practically to the understanding of all who seek the right. It cannot be denied that one company, with the facility to do the business between Europe and America, can do so at a less expense than two companies, because two companies, with two separate organizations, cost in expense twice as much as the one. This was illustrated on the completion of the French cable. Both companies adopted a tariff for ten words of $7.50. This was unprofitable, and the companies, to save themselves from ruin, entered into an agreement for a union of interest, working under one organization, and saving a large outlay in expense. In the case of the two cables no additional charge was made for the transmission of the despatches, although the tariff of $7.50, ruinous under two organizations, with a double set of offices, clerks, officials, &c., under the new arrangement are saved from ruin, yet without any provision to provide new cables when the present ones are worn out or become disabled. Since the new arrangement the shareholders have scarcely received in dividends a sum sufficient to pay seven per cent. interest on the new stock representing the two English and one French cable, the stock of the old Atlantic cable being nearly wiped out and buried in the ocean deep. It is a remarkable fact, notwithstanding the impression to the contrary, that neither cable has earned in any one year a sum above expenses sufficient to have paid for a policy of insurance to protect the shareholders against loss in case of inability, by breakage or otherwise, to transmit messages, and yet the cry comes from the press and the public for more cables and reduced rates. The destruction by the adoption of unwise laws to all telegraphic interest connecting Europe with the United States is a small matter as compared with the great agricultural interests of the United States. In order to compete successfully with the world we must have equal facilities, not only in the transportation of our crops, but in the transmission of orders to buy and sell. The merchant in Liverpool wants facilities to buy grain, beef, pork, and cotton in New York, the same that exist between Liverpool and the ports on the shores of the Baltic and Black Sea. The merchant, when he gives his order, wants to know the price, and if his order is filled, he wants to know the ship and her day of sailing. When he is master of the situation, and ready to sell the cargo afloat to the first customer coming into his counting-room, this facilitates business. The United States wants telegraph facilities, and the people are ready and willing for a tariff that will secure to them those facilities, and that on terms of reciprocity between the cable companies and those using them. Surely Congress does not deem it the part of wisdom to throw obstacles in the way of ocean cables and the commerce of the United States, by depriving those important interests of the privilege of availing themselves of the advantages presented by consolidation, thus largely reducing their working expenses, by which means they are enabled to reduce their charges to the public. The railroads are leasing and consolidating in order to reduce expenses. The Western Union Telegraph have leased and consolidated with other companies until they have absorbed almost the entire telegraph interest in the country, and as the work of consolidation has gone on the tariff to the public has been reduced, and the lines brought into a condition of perfection unequaled in any part of the world. Merchants adopt this principle by consolidating their capital and reducing their expenses in proportion to the capital. One store is found to be less expensive than three or four. The same is true of book-keepers, salesmen, &c. It is true, if Congress pass a law rendering it unlawful for two or more persons to consolidate their capital or arrange for a union of interest, it would create an additional demand for stores, and might possibly increase rents for a season, but it would in effect throw business into the hands of large capitalists, and be damaging to the community at large.

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DEATH OF MR. N. H. RUGG.

This morning our citizens were pained to learn of the sudden death of Mr. Norman H. Rugg, who breathed his last at 3.50, A. M. He was born in this village on the third day of July, 1845, and at the time of his death was twenty five years of age. The deceased attended to his business as manager of the Western Union Telegraph office in this village up to last Saturday night, when he complained of a sore throat and not feeling well generally. Since that time he has failed rapidly, though at times he appeared to be getting better. He has been a member of the Baptist Church in this village for some five years; also a prominent member of the Sabbath School, having filled the position of Librarian for two years, and at the time of his death was Secretary of the School. He was a Director in the Young Men's Christian Association, and an active member of the Saratoga Musical Association. As an efficient member of the Saratoga Fire Department, he has been recognized with the Walworth Hose Association since 1866, and has filled the offices of Assistant Foreman and Director. In 1860 he chose telegraphing as a profession, and entered the Western Union office, his brother then being operator. About two years after he went to Troy, where he did not remain long, but returned to this village, and in 1863 took the management of the office, which he held up to the time of his death. He had been married some three years, and leaves a young wife and a little boy, two years of age, to mourn the irreparable loss of a kind husband and an affectionate father. Mr. Rugg was possessed of many amiable traits of character. He was peculiarly quiet and unassuming in manner, thoroughly upright and reliable in business, and beloved by a large circle of friends. He was a truly Christian young gentleman, and his loss will be as sincerely mourned as that of any person who has died in Saratoga for many years. It is a source of consolation to Mr Rugg's friends that he died trusting in the Saviour of men.—*Daily Saratogian, Feb. 10th.*

NORMAN H. RUGG—RESOLUTIONS OF RESPECT—THE FUNERAL SERVICES.

Universal grief is manifested in town, especially among the younger portion of our citizens, over the death of Mr. Norman H. Rugg. We publish the following resolutions and announcements relative to the deceased, and regarding the funeral services to-morrow.

At a special meeting of Walworth Hose Association, of Saratoga Springs, held on Friday evening, February 10th, 1871, the following resolutions were adopted:

Whereas, It has pleased the Almighty to remove from our midst our friend and brother fireman, Norman H. Rugg, therefore be it

Resolved, That in his character we remember the highest type of manliness, one whose nature was frank and generous, whose word was truth, and whose friendship was sincere.

Resolved, That to those who mourn with the grief of kindred the brother and companion we have lost, we bring such consolation as can spring from the knowledge that in him whom they loved we also found the well-spring of manly affection.

Resolved, That the Association attend the funeral in a body, and that the Hose house be draped for thirty days; that a copy of these resolutions be sent to the family of our deceased brother, and be published in *The Saratogian*, Saratoga *Sun*, and Saratoga *Sentinel*.

A. W. Shepherd, *Sec'y.*

At a meeting of the Directors of the Young Men's Christian Association, held at their rooms to-day at 12 M., the following resolutions were adopted:

Whereas, Our brother, Norman H. Rugg, a member of this Board, has been called by death from us and from his labor for the Master on earth to his rest and reward on high; and

Whereas, This bereavement and the solemnity of this event call for acknowledgment; therefore,

Resolved, That in this dispensation of God's providence, we recognize the hand of a loving Father, who will not willingly afflict.

Resolved, That we cherish the sacred memory of our brother's steadfast Christian life, his zeal in the cause of the Master, and his active efforts to promote the usefulness of this Association.

Resolved, That we extend our cordial sympathies to his afflicted family, and commend them to Him who is the God of the widow and Father of the fatherless.

Resolved, That in memory of our deceased brother, the rooms of this Association be draped in mourning for thirty days.

Resolved, That this Board of Directors attend the funeral services in a body, and request the members of the Association to join them as far as possible.

Resolved, That a copy of these resolutions be furnished the family of the deceased and the village papers for publication.

The funeral of Mr. Norman H. Rugg will be held at 9.30 A. M., to-morrow, at his late residence on Railroad street (between the R. & S. R. R. Depot and Washington street), from whence the remains will be escorted by the friends and relatives, the Board of Directors and members of the Young Men's Christian Association, and the Walworth Hose Association, who will be in attendance in fatigue dress, to the cemetery for burial. From thence the procession will return and proceed to the Baptist Church, Washington street, where, at 10.30 A. M., the funeral sermon will be preached by the pastor, the Rev. Mr. Cheetham.

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The telegraph was not much used by the press in England until February last. Now, some of the papers use it as much or more than ours, owing to the great facilities and low rates afforded them. Formerly the telegraph companies collected, transmitted, and sold news to the press; now, three large associations collect the news, which is transmitted to the associated papers at the low rates of twenty-five cents for every one hundred words sent between 6 P. M. and 9 A. M., and for seventy-five words at other hours. Papers in Edinburgh, Glasgow, and Dublin have wires connecting their local offices, by means of the main-line wires, with an editor's office in London. They pay a yearly rental, and every evening at seven o'clock operators are sent to the offices of the papers, and have the exclusive use of the wire until they go to press. From six to eleven thousand words are transmitted every night.

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THE plan proposed, that our Government should take possession of all telegraph lines, would be of doubtful utility for the public. Falling from the hands of corporations into the hands of politicians, would perhaps be falling out of the frying pan into the fire. The other plan, of compelling by law a uniform rate for all distances, like the charges for mail-matter, is not fair. In carrying the mails, the running expenses do not increase in the ratio of the increasing mail-matter; within certain limits, they remain the same, and increase only very slightly with largely increased quantity. But in telegraphing, every message takes its time and its separate manipulation; and if a wire is worked to its full capacity, the doubling of the number of messages requires a new wire, new operators, batteries, etc. In fact, the running expenses are in a direct ratio to the amount of business. Moreover, for long distances, repeaters or relays are necessary; hence expenses increase to some extent in the ratio of the distance also.—*Builder.*

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, FEBRUARY 15, 1871.

THE FORCES OF NATURE.

The smile which we anticipated on writing our recent article on Magnetic Motive Power, rippled, as we supposed it would, into its peculiar curvatures of incredulity and scorn. We can have no objection to what we so plainly foresaw. We may even congratulate ourselves in thus entering the list of simple and credulous men who have, in all time, earned a similar honor. The truthful expression of thoughts which force themselves upon us as incubating art gives to its work prophecy of future good—be its exhibitions ever so crude, we hope may ever be to us a duty and a delight. We may as well confess to a deep distrust of that empiricism of art which simply multiplies and builds upon experiences, and disdains to re-examine original premises. Had Faraday simply built on the work of his predecessors, his life would have been barren, and the sheen of his example lost. He would have struggled in the meshes of technicalities, as indeed, he long did through false direction, like a fly in a spider's web, instead of placing himself, as he finally came to do, like a little child on the bosom of nature and reverendly accepting her revelations. We believe with Sir John Herschell that "there is no body of knowledge so complete but that it may acquire accession, or so free from error but that it may receive correction in passing through the minds of others." Yet must true men, who, in strong desire to receive from nature her own full-rounded truth, refuse to accept as final any experience even from the highest hands, and who determine to go down to the bases of science to test her foundations, be willing to accept scorn as one of the conditions of success. The cross carves itself on every great invention.

We confess also to be among those who believe that the great forces resident in nature are, to-day, largely unrevealed. Here, for example, is a drop of water. As it glistens before us in its transparent simplicity, it seems the very symbol of weakness. Is it, therefore, weak? Undertake to resolve it into its original elements, and mark the power which that requires. The burning energy of 1000 cells of battery, chemists tell us, is needed to accomplish it. What then? Only this, and the mind staggers at the logic, that in that drop of water resides a power equal to the force needed to decompose it. The statement is simple, yet inexorable. And with such a fact before us, so pregnant with the suggestion of hidden power, must we accept as the final and unchallengeable ultimate that the product of a battery, in which myriads of these drops reside, is to be limited to the click of a lever or the propulsion of a toy? Look at Errickson. See him take the rays of the sun which have been beaming on the earth with unsuspected forces these thousands of years, and project a motive power therefrom, useable by the people of a large belt of the surface of the globe, by processes so simple as to seem to insult the reason. Only a solid fame saves him from a like scorn. It is the first medal truth pins upon the breast. So we have assigned to ourself as the task of our intelligence to respect the toiler after the secrets of nature where-ever found, especially if willing to accept her crown of thorns as one of the conditions of his toil.

In writing this, we have in our mind, as must be obvious enough, the inventor of the mechanism of which we wrote in our last issue. We have no business with or expectations from him. Yet we desire to re-affirm the fact to which we, in our last issue, with some superfluous enthusiasm perhaps, referred, and of which, since then, we have received new corroboration. We have first the data of an examination by an experienced engineer, who gives the result of his examination as follows:

Number of cells of battery	4
Number of revolutions per minute	340
Diameter of pulley	12 in.
Pressure of brake	65 lbs.
Developed in horse-power	1.99 to 2

We also witnessed the only test lacking to us in writing our former article. It had been claimed that the work done by the saw of the motor was accomplished by acquired momentum. To be sure, we knew that momentum was a product and proof of power. But we wanted the test of initial motion against positive resistance. So a break was applied by a man of good average strength, using all his force against a band wheel almost the diameter of that of the motor. The wires were then attached with a battery of three cups, and momentum was at once acquired in spite of the break, and as if no pressure had been applied. This was done in the presence of gentlemen whom no charlatan could deceive. It was simply wonderful.

We do not now accept the theory of infinite development, for we know nothing about it. We do not accept the postulate that there is absence of a positive relation between the consumption of battery and the magnetic development, for that stultifies our judgment. But we do contend that the production of a large magnetic force is derivable from inexpensive elements whose power we have never suspected, and which, to us, is prophetic of great results. History proves that invention keeps pace with the world's necessities. An efficient, safe and inexpensive motive power is needed for a vast range of employments. We believe it will now be given. And we expect to see the shame of an expensive railroad structure erected along one of the chief routes of travel in the chief city of the Union, which is now laughed at as a folly, and voted to be a nuisance for want of a suitable motive power, redeemed by this new agent.

And it is a discovery which should enlist the interest of all true men. The inventor should be aided to new and larger experiments, and we only regret that the invention cannot, with justice to the inventor and those who aid him, be given freely to American ingenuity to elaborate and perfect. We trust, however, that this may be accomplished under his own direction.

MONTREAL TELEGRAPH COMPANY.

We have been remiss in noticing the recent movement of this sterling Company, by which a uniform and low tariff has been established throughout its lines. It is an experiment which we have no doubt will prove successful. A message of ten words can now be sent between any offices in the New Dominion for 25 cents. By a watchful management from the inception of the lines, building with great care and with the most enduring material, maintaining a rigid yet kind discipline, meeting promptly public wants, and under most competent administration, the Montreal Telegraph Co. stands in the very foreground of successful enterprize. In this last act, Canada, by private enterprize, casts her mother England, with her governmental telegraph system, deep in the shadow.

DEEP SEA CABLES.

We give below a list of all known Cable Companies, with their capitals and the market values of their stock. Three, only, out of them all are rated as above par. It seems as if it would require a courageous man to make many ventures in such a field. It is the opportunity given to engineers to realize large profits in construction which is at the bottom of almost all recent opposition enterprizes of this character. Take that away, and a few big names which easy men lend to dignify the schemes, and the petitions to Congress for charters would soon be left neglected and unnursed. Ocean cables should be able to return their cost very rapidly to warrant the immense hazard connected with their provision. That they have not done so is a fact *too* well known to need repetition.

PRINCIPAL SUB-MARINE TELEGRAPH COMPANIES.

1.	Anglo-American,	Capital and Bonds	$8,875,000	25 dis.
2.	Anglo-Mediterranean	Capital,	2,150,000	19 prem
3.	British-Australian	"	3,300,000	34 dis.
4.	British Indian Extension	"	2,300,000	30 dis.
5.	British Indian Sub-marine	"	6,000,000	31 dis.
6.	China Sub-marine	"	3,025,000	45 dis.
7.	Cuba Sub-marine	"	800,000	22 dis.
8.	Falmouth, Gibraltar & Malta.	"	3,300,000	7 dis.
9.	Great North'n. of Copenhagen	"	2,000,000	12½ pr.
10.	Gr't China & Japan Extension	"	3,000,000	17 dis.
11.	Indo-European	"	2,250,000	54 dis.
12.	International Ocean,	Capital and Bonds	1,610,000	at a dis.
13.	Mediterranean Extension	Capital	700,000	55 dis.
14.	Marseilles, Algiers & Malta	"	1,000,000	48 dis.
15.	N. York, Newf'd & London,	Capil & Bonds	3,928,200	40 dis.
16.	Panama & South Pacific	Capital	1,600,000	35 dis.
17.	Société du Transatlantique, Française,	"	6,000,000	30 dis.
18.	Sub-marine*	"	1,691,125	110 pr.
19.	West India and Panama,	Capital & Bonds	3,397,500	45 dis.
	Total Capital		$56,071,825	

*Has exclusive right to connect France with England, and Belgium with England.

POPE'S MODERN PRACTICE.

We have received from the publisher, Mr. D. Van Nostrand, 23 Warren Street, N. Y., a copy of the new edition of Pope's Modern Practice, much enlarged and improved. In all respects we regard this work of Mr. Pope the most practically useful of any which has come to our hands, and such a book as can be read and appreciated by an ordinary mind. This is the highest praise of any book, and we are glad to know that it has successfully entered into its fourth edition.

◆

A NEW MECHANICAL SOUNDER.

Opposition seems to be the rule of the day, and so our advertising page shows that the admirable little mechanical instrument of Putt & Co., Wellsville, Ohio, for learners, to which we directed attention in our last number, has found a rival. Messrs. Tillotson & Co., 8 Dey Street, give notice of an instrument for a similar purpose, using the exact framework of a sounder, with the addition of a key lever to accomplish its work. As both of these advertisements are illustrated, and the prices of each are attached, we can only direct attention to these to all who desire such an instrument. Both are neat, and cheap and convenient.

◆

Some Curious Statistics of Telegraph Cables.—The Atlantic Cable, although it is only about an inch in diameter, covers an area of over a million square feet of the earth's surface, that is to say, about 23 acres of ground at the bottom of the Atlantic Ocean, the area, indeed, of a small farm.

The inductive surface of the conductor of the Atlantic (1865) Cable is about 481,000 square feet, or 11 acres of area. The exterior inductive surface of the gutta-percha is 1,526,845 square feet, or 35 acres.

The conductor of this cable contains 263 tons of copper, drawn into 13,250 nautical miles of No. 18 wire, a length which, laid over the surface, more than suffices to join the north and south poles of the earth.

The insulation contains 338 tons of gutta-percha and compound.

A No. 16 copper wire, of the same resistance as a mile of the insulator of the (1865) Atlantic Cable, would be over 8,000 millions of miles long, that is to say, long enough to be laid round the orbit of the planet Neptune. —*Engineering.*

◆

The North German *Allgemeine Zeitung* contains the following from Versailles:

On the 11th of December a small French lady was baptized in the cathedral, at Versailles, under circumstances such as have never before occurred at a baptism in France. At the entrance of the German troops here, our Telegraph Division arranged the telegraph station for our own use. The French manager had fled, but had been obliged to leave his wife behind, as her accouchment was near at hand. All offers of assistance made her by our Telegraph officials were kindly but decidedly declined. On the 6th of December her family was increased by a healthy girl, to whose baptism she invited the colleagues of her husband. The invitation was accepted with joy, and the officials of the Field Telegraph belonging to the General Headquarters and of the War Telegraph Division, off duty, appeared in their gala uniforms on Sunday afternoon, December 11th, in the cathedral, where the holy rite was performed, much to the chagrin of the inhabitants then present. A rich present reminds the young Christian of the enemies of her country.

◆

Between Forts Banvres and Issy (at Paris), while soldiers were engaged in throwing up entrenchments, they found, at the depth of 1½ feet below the surface, a telegraph cable, similar in construction to the trans-Atlantic cables. It contained seven copper conducting wires, covered by India-rubber, surrounded by 17 strands of wire, which in turn were covered with hemp and tar.—*Illinois Staats Zeitung.*

SUDDEN DEATH OF DR. J. CURE.

On Sunday morning, Feb. 19th, Mr. Josiah A. Cure, for many years past the midnight receiving clerk of the Western Union Telegraph Co., 145 Broadway, N. Y., died at his post, expiring in the arms of his friend and comrade, Mr. Benj. Clark, at that time the only other person on duty. He had just arranged his apparel, previous to retiring to his lodgings, when a violent hemorrhage was brought on by coughing, which, in his feeble state of health, soon brought life to a close.

Mr. Cure, better known as Dr. Cure, entered the telegraphic service in 1847, in connection with the office of the Magnetic Telegraph Co., in Hanover street, N. Y., and has remained in it ever since. Towards the close of last summer, on one of the hottest nights of the season, he sat down on the outer step to enjoy the night breeze and escape the heat of the office, when he was seized with a chill, from which his ill health dated, and from which he never rallied. He was an intelligent and faithful man, and performed his duty to the last with bravery and fidelity, and courtesy. He was a member of the Telegraphers' Mutual Insurance Association.

◆

DEATH OF NORMAN H. RUGG, SARATOGA, N. Y.

On Saturday, Feb. 11th, we received notice of the death of this most estimable man, who had for some time been Manager of the Western Union Telegraph Company's office at Saratoga, N. Y. Mr. W. C. Buell, of Troy, writes of him as follows:

> "A more exemplary young man I never knew. He was kind and courteous to his associates, always gentlemanly and pleasant in his intercourse with his brother operators and the public. His loss is a severe one for the Company, whom he has served for many years with the utmost fidelity. He leaves a wife and child to mourn his loss."

Mr. Rugg had voluntarily dropped his connection with the Telegraphers' Insurance Association, but we are glad to learn that he had maintained an ample insurance elsewhere, which will provide for those he leaves behind him. He leaves us all the memory of a pure and useful life. On another page will be found testimonials of the respect in which he was held by those who knew him best.

◆

The West Indian Telegraphs.—The cable expedition that is extending the West Indian lines to St. Thomas and Porto Rico, was expected to arrive at Jamaica on January 14.—*Engineering.*

◆

THE INGENUITY OF NECESSITY.

No General Post Office in the wide world conducts its operations under such crushing disadvantages, and with as marvelous ability and fertility of resource, as is being displayed in Paris. We are told on reliable authority that within the last few days a pigeon arrived in Paris freighted with despatches that filled from three to four columns of a newspaper, besides 15,000 messages to private individuals! The Abbé Moigno has furnished an interesting account of the process in microscopic photography, by which this miracle of applied science is accomplished. The messages are reduced to points of a millimetre—0.03937 of an inch square. M. Dagron, the inventor of the process, is able to reduce a whole page of the *Journal Officiel* to the square of a millimetre. When the pigeon arrives in safety at its destination with its precious load rolled in the barrel of a small quill, the reading and transcription of the reduced matter is, by the use of the necessary optical appliances, accomplished with ease. The weak point in the pigeon post system is that the flying courier will start from any point to which it can be conveyed, but has only one destination. The speed of an express first-class carrier pigeon is equal to that of the "limited mail." Audubon, the eminent naturalist, computed the speed of the American wild pigeon at above a mile a minute. Another postal appliance in Paris not less wonderful than the pigeon post, is the balloon service, of which M. Godard is chief aeronautical engineer. The splendid station of the Orleans Railway has been converted into a balloon manufactory. The balloons constructed by M. Godard for the postal administration are spherical and 16 yards in diameter, with a cubical content of about 6,316 yards. The material employed is a strong glazed cambric, oiled and varnished. When inflated and loaded, they weigh about a ton, including 600lb. ballast, three persons weighing say 150lb. each, and 1,000lb. weight of despatches. They cost about £250 each. Verily the great war will be long remembered, not only from the before unheard of horrors inflicted, but also from the wondrous inventions or adaptations it has originated.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
February 15, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Feb. 1, the date of the last tariff order.

Managers are hereby required to enter these changes into their tariff book as soon after the receipt of the Journal as possible.

NEW OFFICES.

357 American Cent'l Cros'g, Ill.
342 Busenbark, O.
* Big Indian, N. Y.
222 Cedarville, O.
381 Forest City, Ark., reopened.
33 Manor, L. I. Offices in Dist. A, and offices in Squares 7 to 40 inclusive, and 45 and 46, will charge 15 cents more than their rate to Sq. 41, on business for Manor. Other offices will use rate to Sq. 33.
* Manchester, Pa.
139 Moriena, N. Y.
256 Pryor's Station, Ga.
* Phonecia, N. Y.
21 South Braintree, Mass., reopened.
* Shokan, N. Y.
25 South Windham, Conn.
151 Sandy Creek, Pa.
* Shandaken Centre, N. Y.
476 Thayer, Ks.
476 Tioga, Ks.
* West Hurley, N. Y.
385 Winnebago, Ill.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Big Indian, N. Y.	40	3	Rondout, N. Y.
Manchester, Pa.,	10	1	Alleghany City, Pa.
Phonecia, N. Y.,	35	3	Rondout, N. Y.
Shokan, N. Y.	25	2	"
Shandaken Centre, N. Y.	40	3	"
West Hurley, N. Y.	30	2	"

OFFICES CLOSED.

Butler, Ga., Browning, Ill., Evans' Mills, Ala., Germantown, N. Y., Madison, Ark., and Westbrook, Conn.

GENERAL INFORMATION.

Messages may be taken for Watertown, Conn., and sent and checked to Waterbury, Conn., from which office they will be delivered. Charges for delivery, 15 cents. Also:

Messages for Warren, Mass., to be sent and checked to West Warren, Mass. Charges for delivery, 75 cents.

The name of the office heretofore known as Pocotaligo, S. C., is now Yemassee, S. C.

There are two "Summits" in N. Y., as follows:
130 Summit, Chautauqua Co., N. Y.
* Summit, Clinton Co., N. Y.

Business for Mott Haven, N. Y., should be checked to New York City.

Port Clinton, Pa., is in Square 66, not 69, as at first reported.

"Half-rate" business may hereafter be taken for and received from Rodney, Miss., by "half-rate" offices.

ATLANTIC CABLE BUSINESS.

We are advised of following increased rates, to take effect 15th instant:

From London to	10 Words.	20 Words.
Aden	$12 50	$15 00
Benghazi		7 50
Tripoli		5 63
India	17 50	22 50
Ceylon, Farther India and China	18 50	23 50
Penang		30 25
Singapore		33 25
Java—Batvia and [illegible]		36 75
" West of Samarang		29 00
" East of Samarang		30 50

Charge one-half the twenty word rate for every additional ten or fraction of ten words beyond twenty.

Postage from any point, 37 cents extra.

Messages for China may be sent "post Singapore" by paying the Singapore tariff, plus 37 cents for postage.

WILLIAM ORTON, President.

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

Underneath we give a complete list of all certificates of insurance which, on February 1, were dropped from the books of the Association. It includes all the certificates of deceased members, all who have formally withdrawn, and all who, by non-payment of assessments, were regarded as having voluntarily withdrawn. Those marked with a star (*) owe assessments beginning with No. 17. All others either owe more or are the numbers of certificates canceled by death.

Undoubtedly many of these deficits have been caused by temporary circumstances, absence, and forgetfulness. Any one desiring restoration may be restored by the same process by which he or she originally became a member, certifying to health and general eligibility; also that no disease, since the payment of the last assessment, has rendered the party less eligible for restoration. With this requisition, therefore, persons desiring restoration will comply.

Since writing the above, February 10, the following has occurred: February 9th a telegraph order was received to pay the back dues of a member who owed three assessments. Mr. Horner declined paying it, having been so ordered by the auditor, until the monthly report was received. By order, also, of the Executive Committee of the Association, the certificate had been canceled, according to notice given January 15th. On making further inquiry, it was ascertained that the holder was on his death-bed. This morning (10th) he died. The certificate is therefore forfeited, and no assessment can be made. To this course the committee are compelled by the very emphatic vote of the members present at the last annual meeting. We regret it thus becomes a duty to ignore the claim of the heirs. This is only relieved by the knowledge that another insurance existed, which will provide for all moderate necessities.

This is the first case of this kind which has occurred. Let it be a warning to others. Make your remittances promptly. No man can tell that he will not be the next to fall.

It is necessary again to notify members that telegraph orders on Mr. Horner are no longer of any use, the Auditor refusing to accept them until the reception of the office reports giving him credit therefor. This has been caused by the negligence of some to make the proper entries, and occasioning much trouble thereby.

1 3 9 10 11* 14 18 20 32 36 37 39 46 50 57 62 63 66 68 75 81 85 87* 92 96 102

105 107 109 110 112 115 119 123 124 125 130 132 135 137 140 147 149* 151 159 161 165 167 168 170 173 174

180 184 194 195 198 203 204 205 207 214 216 219 220 223 224 226 229 230 236 241 249 250 261 268 272 284

287* 290 293 295 299 310 313 314 320 321 324 325 326 329 334 33[illegible] 340 345 348 355 358 363 365 368 369 370

373 377* 384* 387 399 401 403 404 408 409 410 415 419 421 423 [illegible] 432 436 439 444 448 449 454 458 459 460

465 473 479 480* 486 487 489 490 491 492 493 498 502 515 518 519 522 523 531 534 535 539 540 541 542 543

544 545 551 556 559 567 568 571 573 578 580 582 589 591 593 596 [illegible] 601 607 610 611 612 613 614 620 621

627 633 636 640 641 644 650 651 653 654 657 658 667* 668 675 681 683 687 688 689 691 693 699 703 707

709* 713* 718 732 733 736 739 743 746 752 753 754 756 759 760 765 768 770 785 789* 793 794* 796* 804 805 810

811 816 822 826 827 828 829 834 835* 845 846 847 849* 853 863 864 865 872 876 879 886 889 890 891

892 893 896* 903* 915 921 922 924 925* 933 936 937 967 970 982 983 989

RECEIPTS.

ASSESSMENT No. 17.

47 89 100 104 171 198 311 312 354 416 482
526 542 656 667 698 734 757 770 808 812 859
860 861 868 927 970

ASSESSMENT NO. 18.

15 26 47 59 70 75 86 89 100 104 114
121 171 176 177 198 201 202 206 218 220 221
248 264 271 275 307 308 311 318 354 374 380
388 413 416 418 429 435 437 440 477 482 516
521 526 537 542 554 562 565 566 590 606 615
617 628 629 631 647 655 656 667 702 708 712
714 730 731 734 757 758 770 771 780 792 798
799 808 856 860 866 875 877 882 883 886 896
904 920 923 927 935 943 953 968 972 975 979
987 996

ASSESSMENT No. 19.

4* 5 7 12 17 27 28 29 31 40 41
47 56 58 61 64 65 67 70 72 75 77
78 82 86 91 93 95 99 100 103 104 106
108 111 114 121 123 127 128 129 134 136 138
139 146 163 171 173 176 177 178 181 182 189
190 191 193 197 198 200 201 202 206 213 215
217 218 221 225 228 243 244 245 246 247 248
255 256 257 273 276 279 280 281 282 283 288
294 297 298 306 307 308 309 311 312 316 318
327 328 330 332 342 343 344 354 356 357 359
360 361 362 364 366 367 372 374 376 379 380
382 385 389 391 392 393 394 396 397 398 402
403 406 407 416 425 427 428 434 435 437 438
447 456 466 467 468 469 470 471 472 474 475
477 488 494 495 496 497 499 500 503 504 505
506 507 508 510 514 515 516 517 520 524 526
528 532 533 536 537 542 546 547 548 554 561
562 565 566 569 570 573 574 576 577 579 581
585 586 587 588 594 601 604 606 608 609 615
617 618 622 629 631 639 647 655 661 667 670
672 678 679 680 684 690 692 702 704 710 711
714 717 720 729 735 747 757 758 762 763 764
766 767 769 771 772 776 777 778 779 780 792
800 806 808 813 814 815 817 825 832 844 848
853 854 855 856 866 873 875 876 877 880 882
884 886 896 900 902 904 909 910 911 912 914
917 923 945 946 949 951 952 961 972 974 977
978 979 985 986 988 995 996 1001 1007 1009 1028
1029 1036 1040 1041 1043 1044 1047 1048 1049 1050 1055
1058 1061 1064 1065

◆

CINCINNATI, Jan. 19th.

To the Editor of the Journal of the Telegraph:

Chicago has been indulging her Shakesperian proclivities and assisting in the play of the "Tempest," (at least her wires have been laid in that way.) We can imagine some one there on the morning of the 14th, saying with Alonzo, "Good Swain, have care; where's the matter? Play the men." (For the wires had already been played, and scarcely a "stake" remained,) and possibly Mr. Swain might have answered that he found—

> Not a wire remained; not a single one;
> As my course to the tables I hurried,
> They all lie low, in the beautiful snow,
> With the poles that once held them—now buried.

We (Cincinnati) had no Chicago wire, and upon inquiry East and North, found every one in about the same boat. "Things having come to this complexion," we bethought ourselves to call on the Saints for aid, commencing with the nearest to us.

We called upon our friend Saint Louis: Good Morn, said we. Good friend, can you give us a wire, high or low, to the goodly city of Chicago?

If you will wait a minute, says he, I'le ask our friend out at Kansas City. K. C. says shake; here's my "paw." Just wait till I call Omaha. Now "Om," to the subject, "Pat" remarked, the wires here are "foine." "Howld on a bit, I'le ax Des Moines," and then Des Moines (he's not so slow) gave us a wire clear to Chicago.

Come, boys, to your keys; throughout the land proclaim—

We're O. K. to Chicago (although we're "kinder lame") Send on your biz; we will not shirk; in fact we're equal to the work, and it did'nt need a second telling to have the biz come, either. From the number lists I select the following as being our most important, to show that some business came this way:

On the 16th and 17th we sent and received from New York 935, Buffalo 473, Pittsburg 659, Lafayette 776, Louisville 561, Memphis 436, New Orleans 332 and St. Louis 1,803, a total of 5,525 messages, not including a large number of "Specials" and C. N. D'S. During 24 hours, on one wire alone, (St. Louis) there were 547 messages sent and 458 received. Besides this amount of business, New York used the wire 6 hours with St. Louis, and we sent regular report West over it. We are not given to self-praise, as a general thing, but partly with "Truthful James"—

> I am free to maintain
> That for tricks that are good,
> And ways not vain,
> That Cincinnati office is peculiar

VERITAS.

◆

THE Telegraph line along the route of the Oswego and New York railroad has been completed between Kingston and Big Indian, and the following offices opened thereon:

West Hurley,
Shokan,
Phonecia,
Shandaken Centre,
Big Indian.

Mr. William Winters is the Superintendent.

◆

RECENT BRITISH PATENTS.

INSULATING TELEGRAPH WIRES. D. Spill, Hackney.

The inventor takes gums, resins, or gum resins, caoutchouc, balsams, and camphor, as the bases of the compounds, and he combines with one or more of such solid substances one or more of the fatty or volatile oils, oxidized or otherwise—camphor oil, or nitro-benzole or naptha, or ether—either vegetable or mineral—in such a manner or in such proportions as may be found necessary for the purpose of rendering the above named solid substances permanently flexible and plastic, and consequently applicable to the purpose of insulating telegraph wires

◆

MARRIED.

ALLEN—BEERY.—In Lima, O., on Sunday evening, January 23d, Mr. Frank P. Allen, night train despatcher of the Dayton and Michigan R. R., to Miss Clara G. Beery.

Mr. Allen has been prominently connected with the interests of the D. and M. R. R. for the past three years and a half. We wish him and his bride a long and happy life.

> "May their summer be gay as the roses
> That hang on the bushes in June;
> Their autumn made up of repose,
> As calm as the sleeping lagoon;
> And when the cold blasts of December
> Assail them in life's later years,
> May this be their life—to remember,
> No hour that was shadowed by tears."

X.

JONES—TAYLOR.—In this city, on Thursday evening, January 26th, by the Rev. W. M. Dillard, at the residence of R. C. Major, Travis F. Jones, of Waco, to Miss Florence H. Taylor, of Galveston.

> "As he across the threshold led,
> And every tear kiss'd off as soon as shed,
> His home she enters, there to be a light
> Shining within, when all without is night;
> A guardian angel o'er his life presiding,
> Doubling his pleasure, and his cares dividing,
> To cheer thy sickness, watch thy health,
> Partake, but never waste thy wealth,
> Or stand with smile unmurmuring by,
> And lighten half thy poverty."

◆

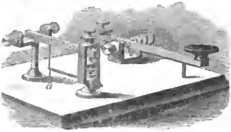
DIED.

RUGG.—In Saratoga Springs, N. Y., Feb. 10th, of Scarlet fever, Mr. Norman H. Rugg, manager of the Western Union Telegraph Co.'s office, and brother to James H. Rugg, of the Albany, N. Y., office, same Company, aged 25 years and 7 months.

TUCKER.—At Chatham Four Corners, N. Y., January 16th, 1871, George R. Tucker, (late operator W. U. Telegraph, 145 Broadway.) Consumption. Aged 32 years.

MECHANICAL TELEGRAPH INSTRUMENT,

PATENTED MAY 31st, 1870.



For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

This instrument is an outgrowth of this pressing demand. The Inventor is himself a practical operator, now in active service. Operators and others wishing to teach or learn the Art, will be delighted with this instrument.

It can be placed anywhere, as it does not occupy a space more than six inches square. A card with the Telegraph Alphabet, Numerals, &c., attached to each Instrument.

Its cost is but $7 and there is no expense whatever to keep it constantly in working order.

Any person selling ten or more of the instruments, will be allowed ten per cent. commission, sent C. O. D., or on receipt of price.

To save expense of returning funds by express, remittances can be made by draft on Cleveland or Pittsburgh, or by Post Office Order, in which case no charge will be made for box. Price $7. Silver-plated, extra finish, $10.

Parties ordering Instruments, except from well-known cities, will please give name of county and State.

Address, D. W. PUTT & CO.,
Wellsville, O.

D. W. Putt,
P. Bruner,
W. G. Brownson.

ATTENTION OPERATORS!

PAT. APPLIED FOR.

We would call your attention to our

TELEGRAPH OPERATORS' BADGE PIN.

Having completed our arrangements to manufacture, by putting in new machinery, and with a full force of workmen. We are now ready to supply the GREAT DEMAND for these Badge Pins. They are made of 18k gold, and are perfect fac-simile of the present Morse, or curved lever keys, and the new style Western Union straight lever and Fancy Base Keys. We are now making two different sizes, one to be three-quarters of an inch long, and the other one inch long. Also, a very small, neat, Badge Key Pin for Lady Operators. These are the only badge pins ever got up exclusively for Operators.

We are, also, manufacturing a complete set of Railroad Badge Pins, for Conductors, Baggage-Masters, Brakeman, Station Agents, and others, consisting of Punches, Passenger Cars (Pullman's Palace Pattern), Switch Targets, Coupon Tickets, &c. These Badges are all made of the most approved patterns.

PRICE LIST.

Key Pin, oval base, one inch long	$6 00
Key Pin, oval base, ¾ inch long	5 00
Key Pin, fancy base, one inch long	7 00
Key Pin, fancy base, ¾ inch long	6 00
Key Pin, oval base, (for Lady Operators)	5 00
Key Pin, fancy base, (for Lady Operators)	6 00

☞ The above are made with straight or curved Levers. ☜

Conductor Punch Pin	$4 00
Passenger Car Pin (Pullman's Palace Pattern)	6 00
Switch Target Pin	4 00
Coupon Ticket Pin (enamel)	4 00

☞ The above are all made 18k gold (warranted). ☜

Persons ordering Key Pins, be particular in giving style of lever and base wanted.

Any of the above will be forwarded by express, C. O. D., or by mail, registered, by sending amount and twenty-five cents extra to pay postage and registration fee.

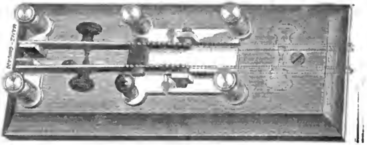
Address,
HARVEY & DOW,
ST. JOHNSBURY,
Vermont.

GRAY & BARTON,

479 STATE STREET, CHICAGO, ILL.,
KEEP IN STOCK THE FOLLOWING ARTICLES:

GALVANIZED WIRE,
COMPOUND WIRE,
SCREW GLASS INSULATORS,
(Cauvet's Patent).
BRACKETS, PINS, SPIKES,
BROOKS' INSULATORS,
PLIERS, VISES, PULLEYS, CLIMBERS,
WINDOW TUBES, BATTERY BRUSHES,
SYRINGES, FUNNELS, HYDROMETERS,
ACIDS AND CHEMICALS FOR BATTERIES,

KERITE WIRE,
BRAIDED AND WOUND OFFICE WIRE,
GUTTA PERCHA OFFICE WIRE,
SWITCH CORD,
CALLAUD BATTERY,
DANIELL BATTERY,
GROVE BATTERY,
BUNSEN BATTERY,
LECLANCHE BATTERY,
HILL BATTERY,



REGISTERS,
RELAYS,
BOX RELAYS,
SOUNDING RELAYS,
SOUNDERS,

KEYS,
MEDICAL INSTRUMENTS,
HOTEL ANNUNCIATORS,
PLUG CUT-OUTS,
CUT-OUTS, (new style),

REPEATERS,
SWITCHES,
GALVANOMETERS,
INDUCTION COILS,
ALARM BELLS.

☞ Our Morse Instruments are of the Western Union, Ottawa (or Caton) style.
We have ample facilities for the execution of every variety of electrical work.

MODERN PRACTICE
OF THE
ELECTRIC TELEGRAPH;
A HAND-BOOK
FOR
ELECTRICIANS AND OPERATORS.

By Frank L. Pope.

Fourth Edition Revised, and Enlarged.

With 40 pages new Matters on Recent Improvements.
1 vol. 8vo., fully illustrated. Cloth, $2.

D. VAN NOSTRAND, Publisher,
No. 23 Murray St. and 27 Warren St.

⁂ Copies sent free by mail, on receipt of price.

☞ FOR SALE IN CANADA by JAMES KEARNS, Montreal Telegraph Company at Kingston.

"THE BOYS' TELEGRAPH"

is a large Monthly Paper, published by amateurs, containing interesting stories, sketches, poetry, puzzles, etc., by the very best writers. Everybody likes it. Terms only 50 cents per year. Single copy, 5 cents. Large circulation; good advertising medium; rates, $7 per column, 10 cents per line.

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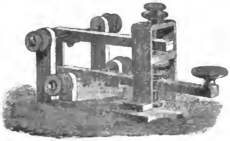
Box 217, Pittsburgh, Pa.



TO TELEGRAPHERS &c.

While we do not *recommend* mechanical instruments for Learners and Beginners, believing it to be quite as essential that they should become familiar with the use of Batteries, running circuits, etc., as the mere mechanical part of the business, still, to meet the wants of those desiring them, we offer our own Combination Sounder and Key, as illustrated above, while we will send to any address, together with Smith's Manual of Telegraphy (published exclusively by us), at the low price of $5 each.

L. G. TILLOTSON & CO.,
No. 8 Dey Street, New York.

Manufacturers and dealers in every description of Telegraph Materials and Supplies.

WHAT WE EAT.

When we pour milk into a cup of tea or coffee, the albumen of the milk and the tannin of the tea instantly unite and form leather, or minute flakes of the very same compound which is produced in the texture of the tanned hide, and which makes it leather as distinguished from the original skin. In the course of a year a tea-drinker of average habits will have imbibed leather enough to make a pair of shoes, if it could be put into the proper shape for the purpose.

A great many things go into the mouth. This is not an original remark. We have seen it somewhere. But it is an alarming fact. We drink, every one of us, a pair of boots every year. We carry iron enough in our blood constantly to make a horse shoe. We have clay enough in our frames to make, if properly separated and baked, a dozen good-sized bricks. We eat at least a peck of dirt a month—no, that is not too large an estimate. The man who carelessly tips a glass of larger into his stomach little reflects that he has begun the manufacture of hats, yet such is the case. The malt of the beer assimilates with the chyle and forms a sort of felt—the very same seen so often in hat factories. But not being instantly utilized it is lost. Still further: it is estimated that the bones in every adult person require to be fed with lime enough to make a marble mantel every eight months.

To sum up, we have the following astounding aggregate of articles charged to account of physiology, to keep every poor shack on his feet for three score years and ten:

Men's shoes, 70 years, at 1 pair a year..............	70 pairs
Horse-shoes, 70 years, at one a month, as our arterial system renews its blood every new moon..	840 shoes.
Bricks, at 12 per 7 years..............................	120 bricks.
Hats, not less than 14 a year.	960 hats.
Mantels, at 1½ a year..................................	105 mantels.

Here we are surprised to observe that we eat as many shoes as we wear, and a sufficient number of hats to supply a large family of boys; that we float in our blood-vessels horse-shoes enough to keep a span of grays shod all the while; that we carry in our animated clay bricks enough to build a modern fire-place, and in our bones marble enough to su[illegible] neighbors with mantels. We have not figured on the soil, at the rate of a peck a month; but it is safe to say that the real estate that a hearty eater masticates and swallows in the course of a long and eventful career would amount to something worth having, if sold like the corner lots on State street, at $2,000 a front foot.—*Chicago Post.*

◆

Indorsed on the back of a remittance from Cobleskill, N. Y., we find the following:

While we revere the memory of Franklin, who enticed the lightning from the clouds, we *love*, and desire to cherish, the memory of him who tamed and taught it to serve our use.

"Till now on land and 'neath the seas,
It goes the will of man to please,
And on its blazing wings conveys
The tidings of these mighty days;
Till word of armies, thrones and kings,
Along its lines it quickly brings:
While answering thoughts along its track,
With lightning speed are hurried back."

H. T. D.

◆

PERSONAL.

Gen. Smith is now President of the Havana Cable Company, and he has constructed a terrible rival out of the Western Union Telegraph Company, which, according to his account, is controller of both the English and French cables, having browbeaten the French Cable Company into an alliance with the English, and is now playing the part of intimidator or absorber of every cable company which is organized. Gen. Smith holds that the Western Union Telegraph Company is selling its stock above real value by at least 10 per cent., and he and others who are interested in laying wires through the deep waters find the deepest water of all to be right around the Capitol at Washington, where Mr. Orton uses the lightning to strike his emulators down.—*Chicago Tribune.*

THE writer of the following is evidently in trouble, and we publish his prose poem for his benefit. There is something very ludicrous in the way S. W. M. emphasizes and expresses his vexation. He will never be hung for obscurity.

MEDDLESOME OPERATORS.

The greatest annoyance on a telegraph line,
Is operators breaking in, who never dare "sign."
Our string, which connects the Delaware with Atlantic,
Is troubled so at times, it nearly makes one frantic.

If to mind their own business they would make it a rule,
They'd often save the trouble of being called a *fool*.
They have an idea that as operators they're unexcelled,
But in my opinion, from the line should be expelled.

If a fellow wants an office, and calls but once,
They're bound to break in and say "Sign" like some dunce.
If they'd do so when called, it wouldn't be so mean;
But if we speak about it, they ask "who's running this machine?"

It seems to me that these "Pings" have nothing else to do,
If not, should advise them to learn the rules of W. U.
Am positive that none of them knows the rules exact;
They'd rather sit and bother those who have business to transact.

I have often heard our chief saying on the line,
That if once caught breaking, they'd certainly get their time;
But why they can't be caught is a mystery to me,
I think by a little planning, it could be done very easily.

And, oh! what a blessing 'twould be to any "string"
To get rid of these nuisances, who try to make things ring;
But fail in the attempt, and make fools of themselves,
And have the ill feeling of all, "*You know how it is yourself.*"

S. W. M.

◆

ELECTRO-MAGNETIC WEIGHING MACHINE.—Henry Fairbanks, St. Johnsbury, Vt.—Jan 17.—In this machine an electro-magnet controls the motion of a sliding poise; the motion of the beam making the electrical connection when the poise requires to be moved, such connection being broken by the movement when the scale is balanced, thus automatically determining the weights of varying loads by a poise moved by mechanism under magnetic control, and indicating the same by means of figure-wheels.

NEW PATENTS.

GOVERNOR FOR ELECTRO MOTORS. Thomas A. Edison, Newark, N. J., assignor to himself, Elisha W. Andrews, George B. Field and Marshall Lefferts, New York, N. Y.

Claim.—A yielding fly, rotating against the atmospheric resistance, and so arranged as to break or close an electrical circuit, in combination with a revolving electro magnetic motion, substantially as and for the purposes set forth.

CONNECTION FOR TELEGRAPH WIRES. George Bartlett Prescott, New York, N. Y.

Claim.—An insulated telegraph connector, made substantially as herein shown and described.

RE-ISSUE.

CONSTRUCTION OF ELECTRO-MAGNETS. Henry M. Paine, Newark, N. J., assignor by mesne assignments to the Paine Electro-Magnetic Engine Company. Patents No. 103,231, dated May 17th, 1870.

Claim.—The interposition of a metallic medium between the layers of the coils of an electro-magnet, or the application of a metallic medium as a clothing or covering to the wire of an electro-magnet, as and for the purpose herein specified.

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Cleveland, Ohio

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They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer

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AND

BLISS, TILLOTSON & CO.,

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They are now prepared to fill promptly any orders for goods on hand, or to be manufactured, at Mr. BISHOP's prices in New York.

The long experience of Mr. BISHOP in the manufacture of

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and the reputation he has gained and enjoys for the superior quality and perfection of manufacture of his

SUBMARINE TELEGRAPH CABL

AND

INSULATED WIRES,

of various kinds, insulated with pure Gutta Percha, renders this arrangement a very important one for our numerous patrons throughout the country, and we confidently recommend these goods o their especial notice as being fully equal, if not superior, to any other in use.

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Gutta Percha Covered Telegraph Office Wires, in great variety of and style.

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Subterranean Wires, with Fibre and Bishop's Patent Compound outside.

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Bridge's Patent Electric Cordage.

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for out-door use and office connections.

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Cotton and Silk-Covered Wires, both twist and braided.

This arrangement with Mr. BISHOP, together with our own extensive Manufactory in New York, and our great variety of Telegraph Material in stock, fully establish our claim that our stores are the depots of telegraph supplies in this country.

THE SELF-CLOSING TELEGRAPH KEY.

PATENTED SEPT. 21, 1869

PRICE $5.

A perfect, simple, homogeneous Self-Closing Key.—JOURNAL OF THE TELEGRAPH.

For full description and testimonial see JOURNAL, Dec. 15, 1870. Liberal terms and arrangements will be made with the trade, telegraph companies and contractors. Sample keys now ready.

JOS. J. B. FREY,
Inventor and Patentee.

A. ILLING,
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New York City.

CHARLES WILLIAMS, Jr.,

(ESTABLISHED 1856,)

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Manufactures and has for sale the various kinds of

OFFICE AND MAGNET WIRES,

Including Cotton Covered, Silk, Gutta Percha, Painted, Fancy, and

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BATTERIES,

For Telegraphing, Plating, Electrotyping and Experimenting.

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POLICE TELEGRAPH.

GAMEWELL & CO., PROPRIETORS,

NO. 104 CENTRE STREET, NEW YORK.

This system of Fire Alarm Telegraph, with a central office, or upon the

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is now in operation in the following cities, to which reference is made for evidence of its great SUPERIORITY AND VALUE, and UNIFORM reliability:

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ST. LOUIS,
BUFFALO,
BALTIMORE,
MOBILE,
NEW ORLEANS,
PITTSBURG,
LOUISVILLE,
ALLEGHANY,
MONTREAL,
QUEBEC,

PORTLAND,
ST. JOHN, N. B.,
HARTFORD,
TROY,
NEW HAVEN,
ROCHESTER,
SPRINGFIELD,
TOLEDO,
ALBANY,
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MILWAUKEE,
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The distinctive features of

THE AMERICAN FIRE ALARM TELEGRAPH

are a Combination of Circuits, the Automatic Signal Boxes, Electro-Mechanical Bell and Gong Strikers.

THE AMERICAN FIRE ALARM AND POLICE TELEGRAPH is covered by some twenty patents. Very early after its introduction into Boston, GAMEWELL & Co. purchased the original patents of FARMER & CHANNING, and during the past fifteen years have spared no expense or pains to improve and perfect this system.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

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LIGHTNING ARRESTERS,

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And every variety of Instruments now in use. Among the supplies constantly kept on hand, are the following:

Battery Materials of all kinds, Line Wire, all sizes, Brackets, Insulators, Medical Batteries (induced or direct current), Fire and Burglar Alarms for Banking Houses and Private Residences, as well as for Cities and Towns; also Contractors for the Construction, Reconstruction and Repair of Telegraph Lines throughout the United States.

All the Standard Works on Telegraphy furnished at the lowest prices, among which is the latest work of

MODERN PRACTICE OF THE ELECTRIC TELEGRAPH,

By Frank L. Pope.

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All orders executed with promptness, and satisfaction guaranteed to the quality of articles supplied.

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We are now making and keep on hand a style of

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for measuring resistances, which has the following merits.

1. It is designed especially to meet the wants of

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1 OHM TO 14,000,000 OHMS,

to measure either instruments, lines or insulation with equal convenience.

2. It is made on the

WHEATSTONE BALANCE

principle, which is the most

RELIABLE AND ACCURATE

method of measuring resistances, involving less liability to error than any other.

By this plan it is the resistance itself which is

MEASURED DIRECTLY,

and not some other thing from which the resistance has to be computed by a series of calculations. Its use is therefore

EASILY LEARNED

in a few minutes time.

3. It is

LIGHT AND PORTABLE,

the whole being contained in a small box which a man can easily take in one hand like a valise.

By our arrangement of connections and resistance coils a great range of measurements is obtained without the usual drawback of a cumbersome and heavy box.

4. To bring the instrument into general use we put the price at the low figure of $100, with $10 extra for an outside case and set of flexible cord connections.

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Best Conductor Lamp, of German Silver, without Reflector,	8 00
Best Conductor Lamp, of Brass, without Reflector.......	6 00
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As an Insulation for Telegraph Cables and Electric Conductors GUTTA PERCHA has been universally adopted by all scientific and practical Electricians and Manufacturers of Telegraph Cables and Wires in this country and Europe, and has sustained, with increasing confidence in its superiority, the practical test of over twenty years' general use.

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that he will guarantee to make and deliver at his Factory any style of Cable, Insulated with Gutta Percha, as low as they can IMPORT *Cable of the same style and quality.*

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Any goods of my manufacture *(except Telegraph Goods)*, are for sale in New York, by

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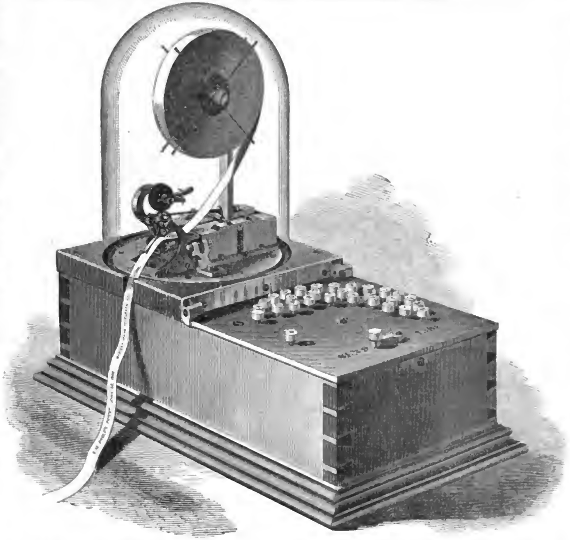
JOURNAL OF THE TELEGRAPH.

VOL. IV. NO. 7. NEW YORK, MARCH 1, 1871. WHOLE NO. 80

PHELPS' LETTER PRINTING INSTRUMENT FOR PRIVATE LINES.



When the Electric Telegraph was first invented, its use was mainly confined to rapid communication between the larger cities; but it was gradually extended to places of less importance, until it now embraces not only the cities but nearly all the villages of the civilized world.

Within the last few years however, a new field of usefulness has been developed for this enterprise, which promises to be almost, if not quite, as important and extensive as the former. We refer to its use upon private lines for affording means of constant and rapid communication between the residences and offices of business and professional men; between offices and manufactories; between banking houses and other financial establishments for the purposes of furnishing stock and market quotations to merchants; and for hundreds of other similar purposes.

The various systems of telegraph which have been devised and employed for communications of a general character, and which require a certain degree of skilled labor for their successful operation, have not hitherto been regarded as affording all the requisite facilities to meet the wants of this new demand upon the telegraph. What seemed specially required was the production of an instrument simple in its construction, not easily got out of order, and requiring little or no practice in its manipulation. For many years past the efforts of inventors and mechanicians have been devoted to the production of signal instruments, whereby the pressure upon a series of keys, corresponding to the letters of the alphabet at the transmitting station, should cause a pointer to indicate corresponding letters upon a dial at the receiving station. These instruments, as a general thing, were inexpensive, and had all the necessary requirements of simplicity, and could be operated successfully with very little practice; but as no record was made by them, it was necessary for the receiver to write down each letter as it was indicated by the pointer. This was found in practice to be not only slow and laborious, but to cause serious errors, and the system failed to meet the requirements of the situation.

For some years past Mr. G. M. Phelps, the mechanician of the Western Union Telegraph Company, has been engaged in inventing and perfecting a letter printing telegraph for private lines, which should meet the public wants by combining all the essential requisites of a simple and reliable apparatus, which could be successfully operated with very little practice.

The above cut represents the instrument as perfected, containing both the transmitting and receiving apparatus. The type-wheel is carried around and the letters printed by electro-magnetism, thus avoiding the use and complication of wheels carried either by weights or springs. By pressing one of the lettered keys upon the transmitter, the corresponding letter is printed upon a band of paper at the receiving station. It is not even necessary that any person shall be in attendance at the receiving office, as the operator at the transmitting station, by a simple device, controls the movements of the receiving apparatus. Messages can thus be transmitted by this means to a person's residence, office, factory or other place during his absence, which, upon his return, he will find accurately printed upon a band of paper in plain Roman letters.

The Western Union Telegraph Company, which possesses the sole and exclusive right to manufacture and sell these instruments, are prepared to receive orders for supplying them throughout the United States. At present the demand for them is greater than their means of supply, but they hope soon to so enlarge their facilities for construction as to be able to furnish them promptly as fast as needed.

ORDINANCE

RESPECTING THE USE OF THE TELEGRAPH IN SWITZERLAND.

The Federal Council of Switzerland, in pursuance of the federal law of December 18, 1867, relating to correspondence by telegraph in the interior of Switzerland, and of the International Telegraphic Convention signed at Paris, the 17th of May, 1865,

ORDAINS AS FOLLOWS:

I. *Of Correspondence in General and the Conditions to which it is Subject.*

Art. 1. The Federal Administration recognizes the right of all persons to correspond through the medium of the telegraphs of the Confederation.

Art. 2. The Federal Administration assumes no responsibility by reason of performing the telegraphic service for such correspondence.

It will take all necessary measures to insure the accuracy of the service, as well as the secrecy of telegraphic correspondence.

It is open to any one to inform himself as to the hour when a message is delivered, and as to the accuracy of transmission, by having it repeated back as provided in Article 26 (within).

Art. 3. Telegrams are of three classes:

(1.) *a. Within the limits of Switzerland*, those which emanate from the Federal Government and its departments; from the Governments of the Cantons and their departments; from the commanders-in-chief of the army or *corps d'armée* of the confederation; and from the federal representatives and commissaires in commission.

b. In the international service, those which emanate from the chief officer of the State; from the ministers; from the commanders-in-chief of the land and naval forces, and from the diplomatic or consular agents of the contracting Governments.

Telegrams from consular agents who are engaged in private business are not considered as public telegrams, unless they relate to public business. These telegrams are not, however, refused by the office of transmission, but it is the duty of that office to give immediate notice of them to the central administration.

(2.) Messages relating to the service, that is to say: those which relate exclusively to telegraphic business (and in Switzerland, also, to the postal service), as well as those which relate to measures of urgent necessity in case of public calamities, or to serious railway accidents.

(3.) Private Telegrams.

Art. 4. Public telegram are not recognized as such unless authenticated by the seal, or other insignia, of the authority sending them.

The sender of a private telegram may always be required to prove the genuineness of the signature borne upon it.

Art. 5. The original of the telegram must be written legibly, in German or Latin characters, or in Arabic figures, which are represented in the regular table of telegraphic signals.

The text must be preceded by the address and followed by the signature.

The address should include all the particulars necessary to insure the arrival of the dispatch to its destination.

It should include, in great cities, the street and number, or in default of these indiciæ, the profession or other like particulars concerning the person addressed.

In small places, also, the name of the party addressed should, as far as possible, be accompanied with directions which may guide the office to a correct delivery in case of any alteration of the name itself.

Dispatches in which the address do not contain all these particulars must nevertheless be transmitted.

In all cases the sender must bear the consequences of any insufficiency in the address.

Art. 6. Within the limits of Switzerland, subject to the conditions imposed by the last article, telegrams may be expressed in any language, or made up in cypher, or in secret letters.

These provisions are equally applicable to international correspondence, subject to the exceptions indicated in the special tariff.

Public dispatches, or those relating to the telegraphic (or postal) service, (class (2)), may be expressed either in whole or in part, in cypher or in secret letters.

Art. 7. Dispatches in ordinary language must contain neither combinations of words, nor constructions, nor unusual abbreviations. (See Art. 21 within). In private dispatches, which are expressed in cypher or in secret letters, the address and signature must be written in ordinary language; the text may be wholly in cypher, or partly in cypher and partly plain. In the latter case, the part in cypher should be continuous, without the insertion of ordinary language, or the placing of it between two parentheses separating it from the ordinary text which precedes or follows it. In other words, the dispatch must contain only one passage in cypher.

The text in cypher must be composed exclusively of either letters of the alphabet or of Arabic figures. If the text is divided into groups, these should be separated by periods, commas or dashes. (See Art. 22 within).

Art. 8. The sender must write on the original dispatch his conditional directions as to paid answers, (Art. 25), messages repeated back, (Art. 26), telegrams to be followed up, (Art. 28), duplicate dispatches, (Art. 30), the mode of transmission beyond the lines of the telegraph, (Art. 32), and the delivery of the dispatch into the hands of the person to whom it is addressed, (Art. 34).

Dispatches which are to be repeated back must have the word "recommandé" inserted before the address. The words "*answer paid*" must be written between the text and the signature.

Other directions should be placed after the address.

Art. 9. The transmission of dispatches shall be made in the following order:

(1.) Public telegrams.
(2.) Service telegrams.
(3.) Private telegrams.

Once begun, the transmission of a dispatch shall not be interrupted to give place to a communication of a higher class, except in cases of the most urgent necessity.

Dispatches of the same class shall be transmitted, by the sending office, in the order in which they are deposited, and by the delivering office in the order in which they are received.

Between two offices which work in direct connection with each other, dispatches of the same rank shall be sent in alternative order.

This rule may nevertheless be departed from for the sake of rapidity of transmission, on lines which are constantly in use, or which are *desservies par des appareils speciaux*.

Art. 10. The administration will be the judge in its relations with the sender, as to the route which shall be given to dispatches, as well in the ordinary service as in case of interruption, or of accident to the ordinary routes of transmission.

Art. 11. When an interruption of telegraphic communication occurs while a dispatch is in the course of transmission, the office in going from which the interruption occurs, must forward the dispatch immediately by post, or by the most rapid means of transmission which is at its disposal. It should address it, according to circumstances, either to the first telegraph office, in order that it may be sent by telegraph; or to the office of its destination, or to the person addressed himself. As soon as communications are re-established, the dispatch must be transmitted anew by telegraph, unless in the meantime its receipt has been ascertained.

Dispatches which in case of interruption are addressed by post to a telegraph office, must be accompanied by an explanatory memorandum (*bordereau*). The office which receives the memorandum must acknowledge the receipt of it by post, and renew this acknowledgment by telegraph as soon as communications are re-established.

When a dispatch is sent directly to the person to whom it is addressed, it must be accompanied by a notice stating the interruption of the lines.

The office which sends again by telegraph a dispatch which has already been forwarded by some other channel, should indicate in the preamble that this dispatch is sent as a duplicate. This statement must also be contained in the copy delivered to the party addressed.

The office which has sent telegrams by post may dispense with the resending by telegraph, in case the lines are exceptionally encumbered, or when the resending would be manifestly injurious to the whole service.

Art. 12. The sender of a dispatch, upon proving his identity, may stop the transmission of a dispatch, which he has deposited, if not too late.

When an inland or an international dispatch is thus arrested, the tariff due on an inland dispatch of twenty words must be retained by the administration. Whatever exceeds this tariff, together with any sum which may have been paid for delivery at the domicil, or for prepayment of answer, or for repeating the message back, will be repaid, if the dispatch has been arrested in proper season.

If the telegram has not already been sent by the office of transmission at the moment when it is withdrawn by the sender, he must demand the cancelling of the dispatch in writing. This demand must be made either on the original, which always remains in possession of the office, or it must be annexed to it.

If the telegram has been already sent, the sender can recall it only by sending a fresh dispatch, prepaid, to the office of destination; he must also pay for the answer if he desires to be informed by telegraph of the result of his application.

The office of transmission will use for dispatches of this nature the form laid down in Art. 34 within.

Art. 13. Every private telegram of which the contents seem inadmissible in view of the public safety, or of good morals, may be refused either at the office of transmission or destination. The sender will be informed of such refusal if it is possible.

Any appeal against such decisions must be addressed to the Chief Director of the Telegraph at Berne.

II. *Of Telegraphic Tariffs and of their application.*

Art. 14. The payment of telegraph tariffs shall be made in advance by means of telegraph-stamps prepared by the Administration of the Telegraph, and sold at their nominal value to the senders of dispatches, who must affix them to the original dispatch on the upper part of the paper under the address.

An exception to this rule will be made in the first place in case of very high tariffs on dispatches destined for countries out of Europe, which must be paid in specie at the office of transmission; and, in the second place, in case of an insufficient stamp (Art. 19), and for dispatches which are to be *followed up* (Art. 29), where the collection of the tariff is permitted to be made from the party addressed upon delivery.

The tariff for delivery by express messenger (Art. 32) may, at the election of the sender, be paid by stamps, or collected from the party addressed on delivery.

In all cases when collection is to be made on delivery, the telegram is not delivered except on payment of the sum due.

Art. 15. After the 1st of January, 1868, stamps for 25 and 50 centimes and for 1 and 3 francs shall be for sale at all telegraph offices.

Telegraph stamps shall all bear in the centre a white cross upon a damasked (*damasquiné*) red field of an oval form. Upon the part which forms the frame work to the federal shield shall be inscribed the word "*Télégraphique*," while lower down in a *cartouche* or a white ground the value of the stamp shall be inscribed. The color of the frame work will vary with the value as follows:

Value.	*Color.*
25 centimes	Grey.
50 "	Blue.
1 franc	Green.
3 "	Bronze Yellow.

Independently of the printing in two colors, there shall be in the substance of the paper itself, of every stamp, an impression consisting of the federal cross, surrounded by a double oval ring.

The stamping of telegrams with other stamps than those above described, such as postage stamps, is of no validity.

Art. 16. Dispatches must be deposited in the telegraph offices, or the offices of deposit, and will not be received unless stamped with the telegraph stamps necessary to payment of the telegraph tariff. Subject to this condition, they may also be deposited in the post office, without expense, under seal, and with the superscription:

To the Telegraph Office at .. ..

Telegram.

In this form dispatches can be lodged in all letter boxes, or delivered to the letter carriers, to telegraph messengers, and to country postmen on their rounds, to be telegraphed by the nearest office.

Art. 17. The only telegrams which are sent free within the limits of Switzerland, are those which relate to the telegraphic or postal service. In the international service there are no free messages, except those of an official character relating to the service of the lines.

Art. 18. The tariff for a telegram of 20 words, within the limits of Switzerland, is fixed at 50 centimes. This tariff is increased by the addition of 25 centimes for every ten words or less above twenty. Consequently a telegram of 20 words costing 50 centimes, one of

				Francs.
21	to	30	will cost	75
31	to	40	"	1 00
41	to	50	"	1 25
51	to	60	"	1 50
61	to	70	"	1 75
71	to	80	"	2 00
81	to	90	"	2 25
91	to	100	"	2 50

and so on.

Art. 19. Telegrams stamped with a stamp less than a single tariff of 50 centimes will not be forwarded. They will, however, be registered by the office, and preserved with other original messages.

When a telegram bears an insufficient stamp, but one nevertheless equal to a single tariff, it will be sent forward; but the receiver must pay the sum short with 25 centimes additional.

In case such payment is refused, the administration may have recourse to the sender.

Art. 20. All that the sender of the dispatch writes on the original message, for the purpose of having it transmitted, enters into the calculation of the tariff, except what is described in the seventh paragraph of the following article. For example, the conditional directions mentioned in article 8 are counted as part of the dispatch.

Words, numbers, or signs, added by the office in the interest of the service, are not taxed.

Art. 21. The maximum length of a word is fixed at seven syllables; anything beyond that is counted as a separate word.

Expressions formed by uniting words by a hyphen are counted for as many words as compose them.

Words separated by an apostrophe are counted as so many separate words.

Proper names of cities, and of persons; names of places, squares, boulevards, &c., titles, prefixes, *particules*, and qualifications are counted for as many words as are used to express them. A single exception to this rule is made in the internal service of Switzerland, where words such as Chaux-de-Fonds, St. Gall, occurring in the address, are counted as one word.

Numbers written in figures are counted for as many words as they contain groups of five figures, with one word added for any surplus.

Every separate character, letter, or figure, is counted as a word. It is the same with *souligné* (underlined).

Signs which the instruments express by a single sign (marks of punctuation, hyphens, apostrophes, inverted commas, parentheses, new paragraphs) are not counted.

The following are counted as one figure; periods, commas, and the points of division which enter into the formation of numbers.

Art. 22. The enumeration of words in dispatches in cypher or secret numbers is made as follows:

All the characters, figures, letters, or signs, employed in the text in cypher are added together, and the sum of them divided by five gives the number of words which they represent. The surplus is counted as one word.

To obtain the total number of words in the dispatch, the words in ordinary language in the address, the signature and in the text (if it contains any) are added to the foregoing. These are reckoned according to the rules laid down in the preceding article. (See Art. 26 within, last paragraph).

Art. 23. The name of the office of transmission, the date, the hour and minute of the lodging of the dispatch, are officially notified to the party addressed.

The sender can repeat these particulars in whole or in part in the text of his dispatch. In such case they enter into the computation of words.

Every dispatch by way of correction, or completion, and in general every communication exchanged with the telegraph office in reference to a dispatch transmitted, or in course of transmission, is subject to the tariff, unless such communication is rendered necessary by an error in the service. (See Art. 35 within).

III. *Of Certain Special Dispatches.*

Art. 24. Every sender of a dispatch may prepay the reply which he demands of his correspondent.

He can cause this answer to be addressed to him at any point in Switzerland, if it is an inland dispatch, or of the territory of the States contracting under the Convention of Paris, if it is an international dispatch.

If the reply has not been delivered within eight days following the date of the original dispatch, the sender can, during the term of fifteen days, counting from the same date, claim the repayment of the sum paid for it. After this interval the amount is forfeited to the administration.

In the international service the money paid for a reply is never refunded. If the reply is not presented in eight days, the office of destination informs the sender of it by a dispatch which takes the place of the answer, and which follows the following form:

"Paris from Berne......... No.........

Office answer to No.........of........

Mr.................

The party addressed has not deposited any answer."

Every answer presented after the lapse of eight days is treated as a new dispatch.

Art. 25. Telegrams to which the answer is paid should bear these words after the text and before the signature, as the case may be, *answer paid*, when it relates to an answer of 20 words. *Answer* (number of words) *paid*, when the number of words exceeds 20 and is limited; *answer paid without limit.*

In the two first cases the sender pays the tariff corresponding to the number of words indicated; in the last he makes a deposit of security, the amount of which is fixed by the office.

If the answer exceeds the length paid for, the sender of the original dispatch must pay the proper extra tariff.

The original dispatch should repeat in the preamble the statement as to prepayment of the answer.

The answer should in like manner contain in the preamble the statement, *Paid answer to No... ...... from* ....(office of original transmission). This indication does not enter into the computation of words.

AN EXAMINATION OF GROVE'S ARGUMENT FOR AN INVARIABLE MECHANICAL EQUIVALENT OF HEAT.

By the Rev. H. HIGHTON, M.A.

In his "Correlation of Physical Forces" (ed. 1867), Grove urges the following argument for an invariable mechanical equivalent of heat. Not having his book at hand while I write, I give his argument in my own words, but I believe with perfect fairness.

If, says he, two different gases, by the application of equal quantities of heat, could raise different weights, we should have the following anomaly: Suppose "a definite source of heat (say a pound of mercury at 400 degrees)" were applied to each of two gasses, each working a piston, and they were to be set to work one against the other; then, if they exerted unequal pressures, the one must expand and compress the other; consequently the one which was compressed must evolve heat, and would by such evolution of heat raise the heat of its pound of mercury to, say, 401 degrees. Thus, says he, we should have the anomalous result that one pound of mercury at 400 degrees, could raise another pound from 400 degrees to 401 degrees.

This I believe to be a perfectly fair representation of his argument.

In answer to this, let me observe, that if one gas or vapor, when expanded by a given amount of heat, will raise 10 lbs., while another by the same amount of heat will raise only 1 lb., and if this be a real fact, a fact established by our best experimenters in observing the specific heat, and rate of expansion, and elasticity of vapors and gases, it cannot be the slightest use to raise theoretical and imaginary difficulties to prove, theoretically, that such a fact is impossible. Theories must be squared by facts, not facts by theories.

But let us see the fallacy of the argument.

To say nothing of the fact that a pound of mercury at 400 deg. cannot strictly be said to be "a definite source of heat," that is, the source of a definite amount of heat, without knowing the circumstances of the body with which it is to be brought into contact, Grove seems to suppose that the first pound o mercury heats and expands a gas or vapor without losing any of its own heat. He supposes it still remains at 400 deg. But if it sinks to 398 deg. in expanding and heating the gas to which it is applied, what anomaly, or even difficulty, is there in supposing that while it sinks to 398 deg. it may raise another pound to 401 deg.?

It is just what we should expect. Steam at 100 deg. C., condensed in a solution of chloride of calcium, will raise it to a much higher temperature than 100 deg.

Now, here is another nut to crack for Mr. Grove, or any other advocate of an invariable mechanical equivalent of heat. Let him calculate the specific gravity, the specific capacity of heat, the expansion by heat, and the elasticity or compressibility of mercury and water. I think this calculation (unless I am much mistaken) will show that a given quantity of heat applied to expand mercury will raise seven times the weight that it will if applied to expand water.

The idea of an invariable mechanical equivalent of heat has taken such deep root in the scientific world, that it will not be easy to extirpate it; but till it is extirpated, together with the supposed axiom of conservation of energy as applied to mixed questions of mechanics and other sciences, it will be a continual stumbling block to true progress.

What is each individual life, vegetable or animal, but a centre for the evolution of force, by disturbing or restoring chemical, electric, calorific equilibrium, by burning and unburning; each of the two kinds of life, generally speaking, working against one another, the one undoing what the other does? And what limit is there to life? The only limit in nature to the production of motion (in the largest sense of the word) is that whatever amount of motion in a positive sense be produced, an equal amount must be produced of motion in a negative sense. But both may be utilized for work to subserve man's convenience.

Putney, Jan. 16, 1871.

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THE DUTY ON TELEGRAPH WIRE.

In discussing the practical workings of the tariff, it is sometimes difficult to say who is directly benefitted by it, or to expose the selfish interests prompting the efforts which are made to secure and perpetuate the imposition of prohibitory duties on foreign products. In the case of the duty on telegraph wire, however, we find a conspicuous example of the power of single individuals or corporations to shape the policy of Congressional legislation with regard to the tariff, and to secure great benefit to themselves at the expense of consumers and the public generally. The favoritism shown in the recent advance in the duty upon the article is so apparent, that it furnishes a forcible illustration of the worst evils of the tariff system, by means of which consumers are compelled to pay tribute to monopolists.

Galvanized iron wire, of No. 8 or No. 9 guage, such as is generally used for the construction of telegraph lines, is now subjected to a duty of two cents per pound and 15 per cent. *ad valorem*, which is an increase of about one and one-half per cent. on the former tariff of 35 per cent. There is but one establishment in the United States engaged in the manufacture of this kind of wire, and, previous to the first of January, when the new tariff went into effect, its market price was 7¼@7½ cents per pound, one large lot having been sold at 6¾ cents, upon which it is fair to presume a reasonable profit was realized, since there is no competition to break down prices. Although the single American manufactory has always been considered by every one, including its proprietors, one of the most profitable establishments in the country, the parties interested, through the judicious exercise of influence, succeeded in convincing the Committee on Ways and Means that their products needed "protection" against the inferior products of European "pauper labor," and the tariff was accordingly increased. In consequence of this increase the price of domestic wire is now fixed at 9 cents per pound, which would seem to secure to the manufacturer a "fair living profit," at least, since wire which cost as much to make as that now offered was sold profitably at 6¾ cents. In consequence of this increase in the tariff, and, proportionately, in manufacturers' profits, each mile of wire costs about five dollars more than before the first of January; and, estimating the annual construction of new telegraph lines, and the rebuilding of old ones, as requiring 15,000 miles of wire, we find a tax of $75,000 per year imposed upon a service, the tolls of which our intelligent representatives at Washington are continually assailing as excessive. In point of quality the domestic wire is pronounced inferior to the imported article by all telegraph men, and that made in England by the "British pauper labor" of which we hear so much, is universally preferred, on account of its superior strength and elasticity, and uniform freedom from flaws or other imperfections likely to interrupt the smooth flow of the electric current. But the domestic wire must be protected, of course, for this very reason if for no other; and to show the beneficent workings of this particular item of the tariff in encouraging domestic industries, it may be added that the iron rods from which our domestic wire is drawn are imported—the manufacturers ignoring the much protected iron-workers of Pennsylvania and the West in order that they may purchase the best material in the cheapest market.

The monstrous monopoly thus fostered beneath the sheltering wings of the tariff is not likely to suffer from competition. The establishment of a manufactory of this kind requires a heavy outlay of capital, and perfect knowledge of the business; and as there is, fortunately, no guarantee to be obtained that a wiser and more truly representative Congress will not soon upset the tariff system in the interest of consumers, but few capitalists, however enterprising, would care to risk the experiment of engaging in a business established upon so uncertain and precarious a foundation. The monopoly now enjoyed by the one company engaged in the business is, therefore, secure against competition, and as long as it can retain its influence in the lobby and committee rooms, it need be troubled by no anxious fears of losing its practical control of the American market. In view of such facts, who dare say that the tariff is not "beneficent," as claimed by those who advocate the "protection of domestic industries."—*New York Daily Bulletin.*

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CURIOUS RESULTS FROM ELECTRICITY.

From the Mechanics' Magazine.

Sir: There exists, perhaps, no science which gives more curious phenomena of unexplainable effects of the unlimited powers of natural laws than that of electricity.

The human mind is sometimes bewildered to understand its apparently contradictory results which are evolved from one and the same process, and which is the cause that our knowledge of electricity is so very limited even at the present time, and notwithstanding the great progress of our conception of all those branches of sciences which reveal to us the rationales in nature.

We know that metals are excellent conductors of the electric fluid, and that they possess the power of producing the evolution on which those phenomena depend. We are, nevertheless, and in many respects, at a loss about different observations and sensations in nature, and principally the ever-changing attraction or so-termed affinity to each other to form simple, double, or triple combinations and solvents for the intended purpose.

So, for instance, if two piles, composed of different metals alternately placed, such as zinc and silver, with pieces of leather interposed between them moistened with a solution of muriate of ammonia, or even of mere water. From each of these two piles a wire being passed, several curious and interesting phenomena result.

When an animal is placed between the wires which connect the two piles, a shock similar to that from a charged electric jar is felt; when placed on each side of the tongue a pricking sensation and somewhat of an acid and salty taste is experienced; when the head forms part of the circuit, the wires being placed in the ears, a crackling sound is heard, and a flash of light appears, if the eyes are brought in its course. Excessive pain is also felt if its influence is directed on a surface where the skin is wounded. When the wires from the two piles are brought within less than two inches of each other and under water, the water suffers a decomposition, hydrogen gas being separated by the wire coming from the pile of silver, whilst pure oxygen is obtained from the wire of the zinc pile, the wire itself suffering oxidation.

If one part of tin and one of zinc are melted together, and mixed with two parts of mercury, it forms an amalgam which wonderfully augments the power of electric machines if agitated in a box rubbed with chalk.

I am, Sir, yours, &c.,

A. Dembsinsky.

London, February 7.

FARADAY AS A DISCOVERER.

By Professor Helmholtz.

The name of Faraday is one to be held in reverence by all natural philosophers. Many times in London, in connection with lectures which I delivered at the Royal Institution, I had myself the privilege of his obliging help and the pleasure of his amiable society. The perfect simplicity, modesty, and undimmed purity of his character gave to him a fascination which I have never experienced in any other man. I had therefore a duty of gratitude to fulfill toward him.

But apart from this, and apart from that friendship for Faraday's younger associate and successor, the author of this book, which induced me to undertake the task, I believed that I should render a service by facilitating, as far as in me lay, an insight into the action and character of a mind so richly and peculiarly endowed, and so entirely the product of natural growth.

It is, moreover, by no means for the philosopher only that such an insight possesses interest. His interest, certainly, is the most immediate, for it has hardly been the lot of any single man to make a series of discoveries so great and so pregnant with the weightiest consequences as those of Faraday. Most of them burst upon the world as surprises, the products, apparently, of an inconceivable instinct; and Faraday himself, even subsequently, was hardly able to describe in clear terms, the intellectual combinations which led to them. These discoveries, moreover, were all of a kind calculated to influence in the profoundest manner our notions of the nature of force. In the presence of Faraday's magneto-electric and diamagnetic discoveries more particularly, it was impossible for the old notions of forces acting at a distance to maintain themselves without submitting to essential expansions and alterations. The clearer expression of these changes is at the present hour the object of physical science.

In what way such extraordinary results were achieved is naturally a question of the first interest to the investigator who strives after similar though more modest ends. But Faraday's developement appears to me to possess no small human interest in relation to many theoretic questions of psychology, and to the art of education. The external conditions under which he cultivated those striking capacities which excite our wonder were the simplest that can be imagined. He was completely self-taught; brought up in humble circumstances, having received no more than the commonest instruction, and having been only favored by fortune in the circumstance that when he was a poor apprentice to a bookbinder, he found, at the right time, a helper in Humphry Davy, who recognized his peculiar gifts, and procured for him the possibility, though in a subordinate position, of working in the direction toward which his genius impelled him.

And throughout his whole life and labors the advantages and disadvantages of such a mode of developement reveal themselves in simpler and larger traits than in the case of most other similar celebrated names. The principal advantage rose undoubtedly from the fact that his intellect was not too soon subjected to theoretic fetters, but enjoyed its freedom in the presence of natural phenomena; and that instead of book learning, he permitted the fulness of nature herself to operate upon his open mind. The disadvantages are, perhaps, of a subordinate kind; but they reveal themselves in quite as unmistakable a manner when he strives to give expression to his ideas, and to supply, by all kinds of sensuous imagery, the want of mathematical culture. This is manifestly the way in which he alighted upon his lines of force, his ray vibrations, and other notions, which bewildered the investigators of his time, and the truer and clearer meaning of which has been in part made out by mathematical theory since Faraday himself ceased from his labors.

And still, in this unlearned son of a smith, who held fast throughout his life the pious creed of his fathers, ran a vein of philosophy which gave him the right to be ranked among the foremost of those engaged in the general intellectual travail of our age. That, as Tyndall informs us, he retained the term "natural philosophy," usual in England to express physical science, and the name "philosopher" for the cultivator of that science—lies essentially in the nature of his work. After the science of our age, in its laudable efforts to make human knowledge a true image of the actual universe, had shattered many an old metaphysical idol, it halted amid the transmitted forms of physical ideas regarding matter, force, atoms, and imponderables. These names were even converted into new metaphysical shibboleths by those who thought themselves most advanced in the way of enlightenment.

It was these ideas that Faraday sought in his riper labors to purify from everything theoretical which was not the true and immediate expression of the facts. More especially he opposed the action of forces at a distance, the assumption of two electric fluids and of two magnetic fluids, and, in like manner, all hypotheses which contradicted the law of the conservation of force, of which he had an early presage, though he singularly misapprehended its mathematical expression. And in these precise directions he exercised, in the first place, the most unmistakable influence on the physicists of England. The mathematicians among them, especially, labor to render theories of phenomena the pure and true expression of the laws of fact, to the exclusion of all arbitrary theoretic devices. In this way Faraday's ideas, though in a modified form, often reveal themselves with their true significance assigned to them.

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ANIMAL ELECTRICITY.

The so-called animal magnetism is a fiction, a product of the imagination, as there exists no such thing in nature. Mineral magnetism is a fact; there exists a strong attraction of loadstone for iron, nickel, cobalt, manganese, and chromium, and a very weak attraction for platinum and a few other metals; but the pretended operation of magnetism in the human body, or the attraction of one human body to another, is a visionary theory, without the least foundation in fact. Careful investigation by the most eminent and expert philosophers, among whom was our own Benjamin Franklin, has proved that all the pretended phenomena described by the believers in mesmerism, animal magnetism, etc., are either untrue or the result of an over-excited imagination, a semi-conscious motion or action.

Animal electricity, however, is a fact; and as the investigation of such phenomena belongs to the department of physical science, we here offer some remarks upon them.

The power possessed by certain fishes of giving shocks to men and animals with whom they happen to come in contact, has long been known; and also that the nature of these shocks was similar to that produced by an electric discharge through the human body. It is remarkable that the ancient Arabians called such a fish, found in the river Nile, in Egypt, by the same name they used for a stroke of lightning, namely, *raasch*, proving that they considered the power of these fishes similar in its nature to the effect of a stroke of lightning.

It is only recently that these fishes have attracted the attention of the scientific world, and the investigations of Walsch, Hunter, Cavendish, Sir Humphrey Davy, and later of Matteucci, Linari, Dr. John Davy, Faraday, and others, have proved the identity of this peculiar capacity of fishes with that manifestation of force which we call electricity.

Sir Humphrey Davy made, some time before his death, a series of experiments, which seemed to prove that the electricity of these fishes is not identical with common electricity. While he doubted the correctness of this view, he requested his brother to continue the experiments, in order to settle this matter. Dr. John Davy, being military surgeon at Malta, had admirable opportunities for investigating the subject, as the Mediterranean, in the neighborhood of this island, furnishes an abundance of fishes of this kind. He obtained electric phenomena by bringing together the ends of two wires, one in contact with the upper part and the other with the lower part of the electric organ of the fish. In this manner he could decompose iodide of potassium, cause the declination of a galvanometer, and magnetize steel needles, etc. Afterward, Matteucci and Linari discovered that the temperature of the wires was raised and they produced electric sparks. Dr. Davy concluded that the electric properties of the fish are modified by age; in young fish the action of the electric organ resembles that of a common electric machine, and in older, on the contrary, it more resembles the voltaic pile.

Faraday experimented with the torpedo *(Gymnotus electricus)*, which was in the Adelaide Gallery, in London. His experiments again proved that the phenomena mentioned above are not different from voltaic or frictional electricity. He also obtained from the fish the chemical decomposition of water, the declination of the galvanometer, the magnetizing of iron, and even a temporary increase of temperature.

In 1770, Schilling observed in the electric eel, at Surinam, that it attracted a magnetic needle, and exhibited other magnetic phenomena. Afterward this was denied by many naturalists, and called an impossibility; but, according to our present knowledge of the connection of the electric and magnetic forces, we know that the observations of Schilling may have been correct.

It is strange that the animals in which definite electric properties have been observed live in water, and that nothing similar has been noticed in those living in the air. This remark shows us a striking difference between the common electric machine, from which moisture carries the electricity as soon as it is developed, and the electric animals, by whom the electricity is produced in an organ surrounded by water, which is a very good conductor for static electricity in general.

It seems that these fishes are able to communicate the shock to others through the water, in an arbitrary circular direction, by which the fishes that come in their neighborhood are stunned, and that in this way they conquer their prey, or use this power as an invisible defense against enemies. They are, therefore, avoided by all other fishes, to such an extent that, when one of them is caught in a net, no other fish is to be found in the same.

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Military Telegraphy.—The system of giving soldiers instruction in telegraphy has been introduced into the Madras army. A few of the gunners belonging to the artillery at Secunderabad have been ordered to do duty in the telegraph office at that station. When they become masters of the system, the office will be left in charge of military men like that at Kamptee.

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A GOOD JOKE ON BROOKLYN.

Erie, Pa., Feb. 20, 1871.

J. D. Reid, *Esq.*

Dear Sir: A gentleman of this city, wishing to engage a lawyer in Brooklyn, N. Y., to take testimony in a certain case in which he was interested, and not knowing any lawyer in Brooklyn, sent the following telegram: "To the Telegraph Manager, Brooklyn, N. Y.: Ask reliable young lawyer if can take testimony March first. Send his address." Soon after the message was sent an office message was received, saying: "Reliable Young *not known here!*" Signed Brooklyn Office. After explaining in an office message what was wanted, an answer was received, giving the information and address asked for.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, MARCH 1, 1871.

THE TELEGRAPH ON RAILROADS.

The recent disasters on the Hudson River Railroad suggest a very pertinent question, which it is our right to state and our duty to answer. Does the telegraph place within the power of railroad companies a means by which the slaughter of passengers on trains, from such causes, is made impossible? If this can be answered affirmatively, as we believe it can, then it cannot be long before the public will demand, and that, too, with no doubtful utterance, that it be so employed. How can it be so employed? We have the answer at hand from the practice of the Camden and Amboy Railroad Company, under the direction of its efficient Telegraph Superintendent, Mr. Stewart, a communication from whom we hope to give in some succeeding number of the Journal, and had expected to publish in this. The following we give as what we understand to be two of the fundamental orders for the running of trains on that road:

1. *Not more than one train of cars shall ever be allowed to proceed in the same direction between any two telegraph stations.* A train must have left a station before a train at a station behind it is allowed to start. This is governed by the telegraph managers, whose duty it is to signal every train which reaches a station to the stations adjoining, and to notify conductors of the fact.

This order, we understand, is applicable to all trains. If a train, for example, is on the road between Bristol and Bordentown, proceeding towards New York, and has not reached Bordentown, the lightning train must remain at Bristol until advised of the actual arrival of the other train at Bordentown. This is simple, clear, unmistakable. Under such a rule, no such accident as occurred near Yonkers a week or two ago, when, because a train slacked up before crossing a bridge, another train, proceeding in the same direction, slashed into it, to the imminent peril of many lives and the destruction of much property, could have occurred. We claim that this should be enforced as the fundamental law of all transportation by rail. If it cannot be done otherwise, legislation should demand it. Especially should it be enforced on railroads like the Hudson River, Harlem, New Haven, and Camden and Amboy, where the trains are so numerous and danger so evident.

2. When a freight train going East is notified that an express train going West has already passed the next station beyond, it shall remain until the express train has passed the station at which it is thus notified.

We are not certain that this rule is stated correctly, yet we venture to give it as the suggestion of one which might be adopted with ease and propriety. This would prevent passenger trains in motion from exposure by the passage of heavily freighted trains, and of accidents such as that which befel the oil train near Hamburgh. It could not cause much delay to freight, and the feeling of security it would give to travelers would more than compensate for it. If it prevented one Hamburgh slaughter in a century, that were argument enough. But we have not space to illustrate the methods by which we believe complete immunity can be given to railroad travel against many fruitful sources of danger. We shall, however, recur to this subject again, as one of great practical interest to the public and the railroad management of the country. We believe railroad companies would do well to offer a costly and inviting prize for the best method of directing transportation by telegraph. We recommend that it be done. We believe it would lead to the most important results. We cannot forget the remark of Superintendent McCullom, of the Erie Railroad, when the telegraph was first placed at his disposal: "I would rather have a road with a single track and the telegraph, than a double track without it." Many roads are to-day practically without it, because not used as effectually as it might, and of which it is so eminently capable.

We ought to have added that the telegraph operator at each station of the Camden and Amboy road has charge of the "danger" signal, and is therefore held responsible should a collision occur. The rule is that *the danger signal shall always be kept in sight until he knows the track to be clear.* The worst thing, then, that can occur from neglect is a few minutes' delay of an approaching train should the "danger" signal not have been removed. The status of the road is therefore one of danger, until proof is given that it may be traversed with safety—a most admirable rule, and worthy of imitation.

◆

WHISKEY AND AUTOMATICS.

A few days ago a gentleman called upon us to procure a copy of the Journal. This was evidently done as an easy mode of introducing himself as well as a design which he proceeded to describe. It is certainly novel, savors of patriotism, and is as follows. We give our visitor's own statement?

"You know, sir, that the revenue from whiskey has been very large, and is very important. The rate of tax, however, was made so high, that distilling was carried on to an enormous extent in concealment. Where not concealed, there was almost always some connivance between the distiller and the assessor, by which government was cheated out of its proper revenue. So, to be able to collect the tax, it was lowered, and the temptation to concealment so far removed. Now you see, both the concealment and the reduction of the tax, as well as the fraudulent arrangements made with government officers, were equally against the public revenue. The temptation to fraud is so great that it seems impossible to trust any man appointed to such a duty."

"Now, sir, I have a plan by which the difficulty can be fully met. I propose to place a metre on every still, which shall certainly record every gallon of whiskey made, and the machinery of which shall be so constructed that it will, automatically, manipulate a telegraph wire. Is the Great Western an automatic concern?"

No, we are not automatic, but we have good friends in that line. Please go on with your plan.

"Well, you see, there are about fifteen distilleries north of Kittaning, in Pennsylvania. If I had a metre on each of these, connected by a telegraph wire to Kittaning, every gallon of whiskey made would be known there, and a wire to Washington would be all that would be necessary to place the intelligence on Mr. Delano's desk as fast as it was drawn. If that could be done, you see, government would raise the tax again, and could afford to do without the income tax."

There was a touch of patriotism in that last sentence, which moved us to admiration, but we ventured to remark that he would need a distinct wire from every still.

"Oh, yes. That would be fifteen wires from the Pennsylvania stills to Kittaning, which could be easily run on the poles of the Telegraph Company."

And fifteen instruments at Kittaning?

"Yes, but they would be automatic, and not need anybody to watch them, except, perhaps, one man."

And how from Kittaning to Washington?

"A government officer could be stationed at Kittaning to receive the returns from the metres, and send to Washington."

But would not the whiskey makers buy him up the same as before?

"Well, some man's got to be trusted, but, you see, we could "automatic" the returns in some way, so as not to need him either."

Ah, my dear sir, we said, paternally, you don't know how easy it is to cheat by telegraph. Distillers, even with your metre locked in the strongest of boxes, would find out, from some smart youngster who had crossed the threshold of a telgraph office, how to make the wires record whatever amount of whiskey they chose, do what you might to prevent it. To distillers, nothing would be so delightful as just such a scheme.

"Oh, no. Mr. Delano thinks well of it, and will help it, if it don't cost too much. But your's ain't an "automatic" company, is it?"

No, sir. The "automatic" is nearer Trinity than we are, and may aid you. Indeed, this may be a mission for the "automatic" of which it little dreamed, and headquarters may yet be in Brooklyn, near the Navy Yard, where a few smart girls may be all that may be needed to assure Mr. Delano that electricity and whiskey have saved the nation. Science rules the hour.

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We have on hand a few bound copies of the Journal of the Telegraph for 1870, which we will send, postage paid, on receipt of the price—$2.50 each.

THE MORSE STATUE.

We are obliged to omit, from this number, the lists of receipts since our last acknowledgements. They will appear in our next. The balance needed to pay the artists has now been reduced to about $400. We hope we shall be able to acknowledge the reception of that amount by March 15. Let all who design taking a part in consummating this work remit without delay.

We hope in next number to speak definitely of the inaugural arrangements. We may be obliged to appeal for a small amount from each office, to meet the expenses which we are warned, in a city like New York, such a pageant must necessarily occasion. Its commemoration in book form, with the names of contributors, will also require money. Of this we speak timidly. The generosity and universality of the subscription has been grand and inspiring. We dislike to put it to any new proof.

Meanwhile we have obtained the refusal of the Academy of Music for an evening reception, at which, we trust, Prof. Morse will be present, to shake hands with all who come. Of this, more anon. We close this notice by one of the many cordial notes sent to us, which have made us proud of our relation to the movement, and given the assurance of its perfect success:

> DEAR SIR: I am in receipt of your Circular, asking contributions to the "Morse Testimonial Fund," and thank you for the opportunity to aid in the base for the monument.
>
> My brother also asks for the privilege to contribute for the same object, and I now enclose check of my firm for subscriptions of—
>
> | | |
> |---|---|
> | George Granville White, New York | $50.00 |
> | Alex. M. White | 50.00 |
> | | $100.00 |
>
> Yours respectfully,
>
> ALEX. M. WHITE.

Thinking that many would like to see the photograph of the Morse Statue, we have ordered some to be printed suitable for mailing. We will send copies, postage paid, on receipt of fifty cents.

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THROUGH TO MEXICO.

The telegraph line which we announced some months ago as under construction by our friend Jacob Campbell from the City of Mexico to the boundary of the United States, has been completed to Mier, on the southern shore of the Rio Grande. A connection with the American lines cannot be long delayed, and arrangements, we believe, exist to accomplish the connection between Washington and the Halls of the Montezumas.

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THE line of telegraph which has been constructing under the directions of Supt. J. A. Brenner, of the 3d Southern District, to Beaufort., S. C., has been completed.

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HOW TO KEEP POROUS CUPS CLEAN.

EATON, O., Feb. 18, 1871.

To the Editor of the Journal of the Telegraph.

Some time since I noticed in the JOURNAL a communication from a Western correspondent, saying that to cover porous cups with linen would prevent the formation of copper on them. I think I have a better plan, because much less trouble. I cut a piece of common window glass, so as to fit in the bottom of the cup, and set my zinc on it, not allowing the zinc to touch the cup anywhere. I have no trouble with copper forming, and can use my cups for years, unless accidentally broken. By publishing this you may confer a favor on some one that has been troubled with copper on his cups.

Yours, S. S. DIX,

Manager Eaton (O.) Office.

STAMP FRANKS.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
February 6th, 1871.

Executive Order No. 119.

The Complimentary Franks heretofore in use will be discontinued on and after March 15th, 1871, when the new system of Stamp Franks will go fully into operation. Inasmuch as many of the Stamps have already been distributed, they will be received at offices, if presented on and after March 1st. Full instructions as to their use will appear in the next number of the JOURNAL.

WILLIAM ORTON, *President.*

Pursuant to the foregoing Order, the following instructions will be observed with respect to the use of the Stamp Franks:

The Stamps are enclosed in covers, on which are inscribed the name of the person to whom the Frank is issued, the territorial limits and the conditions governing its use. It is desired that messages franked by stamps shall conform strictly to these conditions, and it will be the duty of Receiving Clerks to call the attention of the sender to any plain violation of them, and to report such violation to their Superintendent. They will not, however, be at liberty to refuse a message for that reason, if it is within the limits of the frank as to territory, and if the proper number of stamps is affixed. Every such message of twenty words or less, not counting the date, address, and signature, must have one stamp, and an additional stamp must be affixed for every additional ten words, or less.

If the sender desires to have an answer returned free, he may frank it by affixing to his message the additional stamps required for such answer under the above rule. In such case the words "Answer, —— words free," must be added to the check.

The Stamps are not transferable, and can only be used to frank messages signed by the party to whom they are issued. Each stamp bears the number of the book, enclosing it, and all stamps issued to the same person during the year will bear the same number.

In order to compare the number of the stamp with that of the book, and to see that the message is within the limits of territory prescribed, it will be proper, in all cases, for Receiving Clerks to require the production of the book. But where it is likely to be presented frequently at the same office, a memorandum may be taken of its number and limits, with the name of the holder, and its actual presentation may thereafter be dispensed with.

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TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
March 1, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Feb. 15, the date of the last tariff order.

Managers are hereby required to enter these changes into their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

237 Bluffton, Ind.
392 Crawford, Miss.
138 Colemans, Mich.
138 Clare, Mich.
457 Divide, Ks., reopened.
26 East Douglass, Mass.
26 East Thompson, Mass.
37 Perryville, Conn.
* Fort Atkinson, Iowa.
138 Farwells, Mich.
* Guilford, N. Y.
Greeley, Col., same as Evans, Col., or 100 more than Cheyenne, Wy.
* Gardiner, N. Y.
429 Green Ridge, Mo.
455 Hopkins, Mo.
234 Livingston, Ky.
336 Metamora, Ill.
467 Osage Mission, Ks.
467 Parsons, Ks.
358 Prentice, Ill.
383 State Line, Miss.
230 Sanfords, Mich.
202 New Straitsville, O.
336 Varna, Ill.
336 Washburn, Ill.
367 West Branch, Iowa.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Fort Atkinson, Iowa,	120	8	Milwaukee ch., Chicago.
Guilford, N. Y.,	36	3	Oneida, N. Y.
Gardiner, N. Y.	Given in JOURNAL of January 15, 1871, as follows: 40 from New York, and same as Goshen, N. Y., from Buffalo, Binghamton, and Salamanca, N. Y. Check business same as if for Goshen.		

OFFICES CLOSED.

Plano, Ill., and Toll Gate, Idaho.

GENERAL INFORMATION.

All notices under this heading (General Information) take effect March first, unless otherwise stated.

The privilege of doing "half rate" business is hereby extended so as to include Little Rock, Ark., all offices in Missouri and Iowa, and also such offices in Kansas and Nebraska as are within the system of squares. Offices having, in the column headed "Square," in the tariff book, a number showing the square in which they are situated, are within this system.

"Half-rate" business will also be taken for and received from Lake City, Fla., and the following named offices of the International Ocean Telegraph Company, in Florida, by all Western Union "Half-rate" offices:

Baldwin,
Bartow,
Branch River,
Caloosahatchie,
Fernandina,
Gainesville,
Jacksonville,
Key West,
Newmansville,
Ocala,
Pine Island,
Punta Rasa,
St. Augustine,
Sanderson,
Sumterville,
Tuckertown.

The tariff to St. Mary's, Topeka, and Wamego, Kansas, will hereafter be the tariff to Sq. 473. 473 should, therefore, be entered in the column headed "Square" in the tariff book, opposite the names of these offices.

Offices having books marked Distr. A, B, C, D, or E, should use their tariff to Milwaukee on business for offices of the North Western Telegraph Co. The business should, however, be checked to Chicago, as heretofore. Such offices as have "Chicago" in the column headed "Leaves this line" of the tariff book are offices of the N. W. Co.

The tariff to square 138 is 10 cents more than to square 230; and to square 137 10 cents more than to square 250.

Business for Siverleyville, Penn., should be checked to Oil City, Pa.

The following names of offices have been changed:

Acadia Mines, N. S., to Stellarton, N. S.

Mt. Bethel, Pa., to Portland, Pa.

Under "General Information," in last JOURNAL, for "Warren" read West Warren, and for "West Warren" read Warren, Mass.

ATLANTIC CABLE BUSINESS.

We are notified of following increased rates, to take effect March 1, 1871:

From London to	*10 Words.*	*20 Words.*
Persia	$10 75	$11 80

Half the 20 word rate for each 10, or fraction of 10, words over 20.

PREPAID REPLIES.

Messages to which a reply is prepaid must not only contain the words, "Reply, —— words paid," as a part of the message, but *must show to the check* the amount thus prepaid. For example: A message of ten words from Virginia to London, to which a ten word reply is prepaid, must be checked thus: 10 paid $16.80 and $16.80 for reply.

Replies which have been prepaid must be checked in the following manner:

10 Collect $16.80 prepaid reply to No. —— of 28th.

Note the following characters used by the Cable Co.:

For a horizontal dash: ——— - - - ———

For a perpendicular dash: - - ——— ———

TO OFFICES HAVING "SPECIAL SHEET A."

"Half-rate" business will hereafter be taken for, and received from, the following offices of the Montreal Telegraph Company:

Aultsville, Ontario,
Beamsville, Ont.
Bowmanville, Ont.
Brighton, Ont.
Brantford, Ont.
Belleville, Ont.
Brockville, Ont.
Buckingham, Quebec.
Berthier, Q.
Clifton, Ont.
Cobourg, Ont.
Colborne, Ont.
Cornwall, Ont.
Coteau Landing, Ont.
Dickinson's Landing, Ont.
Dundas, Ont.
Farran's Point, Ont.
Grimsby, Ont.
Gananoque, Ont.
Grenville, Q.
Hamilton, Ont.
Ingersoll, Ont.
Joliette, Q.
Kingston, Ont.
Kemptville, Ont.
London, Ont.
Matilda, Ont.
Morrisburg, Ont.
Montreal, Q.
Newcastle, Ont.
Napanee, Ont.
Oakville, Ont.
Oshawa, Ont.
Ottawa, Ont.
Port Hope, Ont.
Prescott, Ont
Paris Town, Ont.
Quebec, Q.
St. Catherines, Ont.
St. Andrews, Q.
St. Eustache, Q.
Thorold, Ont
Toronto, Ont.
Trenton, Ont.
Thurso, Q.
Terrebonne, Q.
Three Rivers, Q.
Woodstock, Ont.
Whitby, Ont.
Wellington Square, Ont.

WILLIAM ORTON, President.

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

It may save some members of the Association both trouble and expense to know that remittances having in view coming assessments are received and at once credited to these assessments. Not a few pursue this plan, and as soon as a death occurs the JOURNAL at once acknowledges the payments of such prepaid assessment. Of course, all are not able to do this, and will prefer to send the one dollar on each call. Yet to some, who now know that at least five dollars per annum will be called for, and knowing that a P. O. order for five dollars costs no more than for one, it may be a convenience and a relief to know that such prepayments are received. Some are now credited up to assessment 25.

Of course, in saying this, we do not personally desire any increase of funds in our hands to tempt us to infidelity, or for any advantage of its possession. We would rather not have it. And yet were it pursued more generally, it is easy to see that the efficiency and promptitude of the Association would be much increased, even were only two assessments sent instead of one. So let no one think we are urging them to adopt any such plan, yet consider whether or no it would aid them in their duty to themselves and others.

The following are the receipts on assessments 18, 19 and 20, up to February 25th:

ASSESSMENT No. 20.

Occasioned by the death of J. A. Cure, New York, February 12, 1871.

3 5 7 13 16 21 28 35 44 52 56
60 63 83 88 99 101 103 119 131 145 151
156 158 160 164 189 190 191 192 193 197 198
200 208 213 231 269 274 277 286 288 291 301
302 316 341 346 352 353 364 371 378 386 389
391 401 463 494 495 511 512 542 552 560 576
595 600 615 623 626 652 723 724 727 728 743
744 777 778 803 820 821 823 830 880 897 905
930 954 955 956 957 958 959 960 962 963 964
1001 1010 1013 1014 1016 1017 1018 1019 1042 1060 1078
1079 1083

ASSESSMENT No. 19.

Occasioned by the death of D. W. Warner, Cincinnati, O., Jan. 16, 1871.

15 21 25 26 33 38 51 74 90 113 209
240 251 253 271 274 289 291 322 335 336 337
341 413 417 426 445 462 484 511 512 597 600
616 630 674 712 730 731 733 785 843 868 905
918 920 926 927 935 940 966 991 1006 1014 1016
1030 1051 1057

ASSESSMENT NO. 18.

Occasioned by the death of Geo. B. Harrison, Albany, N. Y., Dec. 22, 1870.

33 38 73 211 232 233 240 251 253 303 335
334 337 341 462 490 600 642 649 666 676 733
737 738 808 916 918 926 940 991 1014 1016

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TELEGRAPH ATTRACTION.

Until the removal of the depot the telegraph office has been out of the range of business. Recently the telegraph company have established an office at the Union depot and another in the Odd Fellows' building, in one of the most convenient portions of our city. In the latter office an attractive young lady has been appointed, who is efficient in every respect for the position, and gives eminent satisfaction. This shows that another field of usefulness is open to the ladies, it being an acquirement that many will no doubt learn. This office is a great convenience to our citizens, and will, no doubt, be well patronized.—*Vincennes, Ind., Exch.*

CHICAGO & NORTH-WESTERN RAILWAY CO.,
TELEGRAPH DEPARTMENT,
CHICAGO, February 13, 1871.

J. D. REID, Esq.,
Treas. Teleg'hrs. M. Life Ins. Ass'n.

DEAR SIR: Herewith please find $1.50, with my application for membership in the Telegraphers' Mutual Life Insurance Association. I regard this class of insurance as the best and cheapest within reach, and wish telegraphers more generally appreciated its merits. I think it a generous policy for the Company to foster an Association which will be the means of such great relief to many, and at the same time gives all an opportunity to contribute to the welfare of those dependent upon the profession, in a manner not burdensome, but resulting in mutual benefit.

Yours truly,
GEO. H. BLISS.

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WE regret to learn that George Clark, for eight years past an operator at 145 Broadway, New York, in the employ of the Western Union Telegraph Company, was killed on Sunday, Feb. 19th, while on his way to fulfil an engagement at Mobile, Ala. His death is supposed to have been caused by falling from a train near West Point, Ga. His body was found in a field adjoining the road. No other particulars are known. He had often been invited to join the Telegraphers' Insurance Association, but refused, and now leaves a wife in Brooklyn, N. Y., destitute and without means to bring back the body of her husband: so he was buried at West Point. His own connections reside in Swansea, Wales, where he was himself born. He was an excellent operator, and well liked by his associates.

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BAPTIST SUNDAY SCHOOL.—RESOLUTIONS, ETC., ON THE DEATH OF NORMAN H. RUGG.—In compliance with a vote of the Baptist Sunday School of this village, a series of resolutions was prepared, and was reported at the session of the school, held Sunday afternoon, 19th inst., as follows:

Whereas, God, in His inscrutable wisdom, has removed from our midst our beloved brother, Norman H. Rugg, late secretary of the Sunday School of the First Saratoga Baptist Church; and whereas, the daily walk and conversation of our dead brother had abundantly proven him to be one of those disciples of whom Christ said, "*Ye are the salt of the earth*," and whereas, in a long official intercourse with him we ever found him upright, truthful and kind—a zealous, humble worker in the Sunday School, and a most faithful and efficient officer; therefore—

Resolved, That we recognize in the death of Norman H. Rugg, one of those mysterious providences which, though we may be unable to comprehend it, will yet, in God's good time, "be made known unto us."

Resolved, That, bowing submissively to the inscrutable decrees of the Almighty, we do yet lament the loss of our brother, called away in the beginning of his Christian manhood; and do extend to the wife and relatives of our deceased brother our earnest condolence and sympathy in this the hour of their most poignant sorrow.

Resolved, That a copy of these resolutions be sent to the family of our deceased brother, as the expression of the sympathy of the Sunday School in their deep affliction, and that they also be placed on the records of the Sunday School.

(Signed)

DAVID F. RITCHIE,
F. W. WATERBURY,
P. F. ALLEN.

Remarks were made by the Superintendant, Mr. Carr, Mr. John Palmer, Mr. A. S. Pease and Mr. D. F. Ritchie. Mr. Pease offered the following poetic tribute to the memory of the deceased, which was directed to be attached to the resolutions:

Dead! Dead! Dead!
The living spirit sped!
How could it be that one so loved of all,
From such young life and such high hopes should fall?

Dead! Dead! Dead!
The cheering presence fled!
O, Death! thou art so cruel and so bold!
Oh, Grave! thou art so dismal and so cold!

Dead! Dead! Dead!
From off a weary bed
Kind friends have borne him to the solemn tomb.
Our tears, our love will mitigate its gloom.

Dead! Dead! Dead!
Pillow the weary head
Upon thy bosom, mother Earth. Thy child
Was noble, modest, truthful, proud and mild.

Dead! Dead! Dead!
Above his grave we'll spread
Dead leaves, as emblems of his life so brief;
Cold snows, as emblems of our hearts' great grief;
But tears will mingle with warm summer showers,
And deck his grave and fill our thoughts with flowers.

On motion, the resolutions were adopted and directed to be printed in the village papers.—*Daily Saratogian, Feb. 20th.*

A MERITED TESTIMONIAL.

THERE is something touching in the following testimonial. Nothing but affection and a sterling character could have called it forth:

AN INTERESTING OCCASION.

On Saturday evening, while Mr. Frederick L. Smith, telegraph operator and ticket clerk of the Junction depot, was quietly spending an hour or two with his wife at a neighbor's, his friends in large numbers took possession of his house on Austin street—it being the fifth anniversary of his wedding day—bringing with them an elegant set of parlor furniture, extension table, a set of silver knives, stair carpet and other smaller gifts appropriate of the occasion. The astonishment and surprise of Mr. Smith upon his return was intense Mr. C. N. Ruggles, agent at the Junction, in behalf of the friends, presented the various gifts with the following eloquent and touching remarks:

"*Mr. and Mrs. Smith:* I have been deputed by your friends to perform a pleasing duty. My selection as spokesman is due, without doubt, to the fact that Mr. Smith, for nearly five years, has been intimately associated with me in my business relations. This, then, is a fitting time and place for me to bear cheerful testimony to his fidelity, his industry, and his cheerful disposition in the daily toil of life. I remember how, morning after morning, on first coming into the office, he has always extended to me a cheery, good-natured salutation. This may be deemed by some a minor matter, but the cultivation of an even temper in the wear and tear of a nervous business life is a discipline of the very highest importance.

"Frederick, on this fifth anniversary of your wedding day, your friends, coming from the telegraph and railroad offices, from your social circle and business acquaintances, have rallied in force to give you substantial and abiding evidence of their attachment and esteem. Words are cheap, but these many useful and beautiful gifts, which have literally been showered upon you, attest abundantly the strength and quality of their friendship. These friends have recognized in you not only the traits of good fellowship, but those elements of character which go to make the dutiful son, the affectionate husband, the tender father, the true citizen and the honest man. They have witnessed with satisfaction your tender care for your mother, and your solicitude to make her remaining years pleasant by your filial ministrations. This conduct is manly and noble. They have also sympathized with you in the affliction of sickness which has visited your family during the winter months. And now, this Saturday evening, they gather at your fireside with their gift offerings, that you may be cheered in body and soul, that you may imbibe fresh strength to act manfully and right in the battle of life, and have a renewed confidence in the sacred bond of friendship.

"In behalf of these friends assembled and others absent, I ask you to accept of these various articles as freely and heartily as they are bestowed; and our united wish and prayer is that God's richest blessings may rest upon you and yours."

Mr. Smith responded in a brief and heartfelt manner. The party returned to their homes at a late hour, much pleased with the evening's entertainment. The "Yo Semite" Quartette Club were present and contributed materially to the enjoyment of the evening by their excellent singing.—*Worcester Evening Gazette.*

◆

AMATEUR sends us a communication on the want of patience and courtesy of experienced operators towards learners and the unskilful. It is written in good spirit, but not happily, and without that terseness which makes an article readable. Let Amateur try again.

◆

MARRIED.

CLARK—MURDOCK.—In Natick, Mass., February 9, 1871, Mr. Wm. B. Clark and Miss Abbie J. Murdock, formerly operator at Royalston, Mass.

MECHANICAL TELEGRAPH INSTRUMENT,

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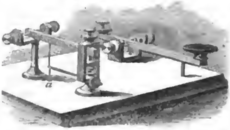

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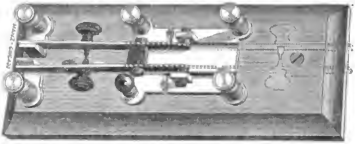

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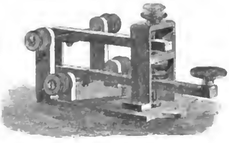

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II. Its officers shall consist of a Treasurer and Secretary.

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IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and th payment of dues

XI. A meeting for the election of officers shall be held annually during th first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy ntil the time of the annual election.

XII. Special meetings of the association may be called upon the written reques of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

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4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

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JOURNAL OF THE TELEGRAPH.

VOL. IV. NO. 8. NEW YORK, MARCH 15, 1871. WHOLE NO. 81

THE STATUE.

According to promise, we now state the condition of the arrangements for the inauguration of the statue of Professor Morse, and the progress of the work.

THE INAUGURATION.

Provided the casting be so successfully performed as to allow the completion of the statue in season, and of which there is now a fair prospect, the inauguration will take place on Prof. Morse's 80th birthday—APRIL 27TH, AT 4 P.M. GOVERNOR HOFFMAN, of the State of New York, will preside. The GOVERNOR OF MASSACHUSETTS, HON. WM. CLAFLIN, assisted by HON. W. H. KENT, MAYOR OF CHARLESTOWN, Mass., Professor Morse's native city, will unveil the statue. WILLIAM CULLEN BRYANT, ESQ., America's Poet Laureate, will deliver the address. The prayer of dedication will be uttered by REV. DR. WILLIAM ADAMS. Should the weather be bad, the addresses may be delayed until evening, and delivered at the Academy of Music.

RECEPTION.

In the belief that a large number of gentlemen connected with the telegraph and with general science, friendly to this ovation, will be called to New York on this occasion, the Academy of Music will be engaged, and Prof. Morse be invited to be present. It will be a good and grand thing thus to meet and shake hands with each other, and with the venerable old man who thus closes his 80th year. But let all bear in mind to use the hand gently that has to bear the pressure of so many. Brief addresses by distinguished speakers will be delivered, and some telegraphic arrangements will be made for contact with the world outside, the nature of which we cannot now fully give. A number of distinguished gentlemen will be on the platform. The lady who sent the first message, "What Hath God Wrought?" and who is now in New York, will also be present.

THE STATUE.

The moulding is now going on with all the rapidity consistent with perfect execution, at the National Art Foundry, 25th street, New York. The certainty of its completion in time cannot be had until April 1, and of which due notice will be given. Parisian workmen, bearing the highest testimonials of skill, are employed upon its details, and the execution will be of the finest ever produced in America.

A CONVENTION.

It has been suggested that the occasion would be opportune for a convention of telegraph superintendents. A convention in the sense of a gathering for the discussion of questions of management is probably now impracticable, and would require more time; but the gathering together of the men who manage telegraphic interests, to see and shake hands with each other, is of easy accomplishment, and will be favored by executive officers. It will be left with the general superintendents, to whom all who desire such a gathering should apply. We hope every facility will also be given to as many operators to come as can. The day may be made a happy and memorable one. If the weather favors, it certainly will be. But we cannot be looked to in these arrangements only as we may add to the heartiness of their welcome. We would like to see 1,000 operators in New York that day, to whom the evening gathering would be a general reception.

THE COST.

The entire cost of the statue, including masonry, architectural expenses growing out of the proposed but now abandoned dome, printing, postage, etc., will amount to $10,626. To the craft we have assigned the statue as its peculiar work, and that will cease with the reception of $9,000, of which we already have $8,500. The remainder of $1,626 we hope to receive from citizens in New York and elsewhere, and most of it has been already obtained. The balance of $500 on the statue will, we feel assured, be in our hands within thirty days. In our issue of April 15 we hope to announce every dollar paid.

We have determined to ask nothing more from the profession in view of the expenses connected with the inauguration. The subscription has already been too noble to do so. We will seek their payment in New York, or in some quiet way by the aid of appreciative men, or its funds may be all secured by the sale of tickets to the reception at the Academy of Music. Let no one fret on that account.

Now, friends, select your delegates. Send your gladdest, handsomest men. And do not let the ladies be forgotten. We wish we had a home big enough to hold you all. Some arrangement will be attempted to make the expenses here light, and of which notice will be given. We would like if the day could be made the gladdest in all your lives. Come.

ONE WORD MORE.

The propriety of erecting statues to living men has been questioned. We are glad that this one is to be inaugurated before the man it will commemorate dies. Prof. Morse cannot be long with us. Five of his college companions, men of ripe scholarship and high in public esteem, whose heads were white with years as many as his own, have passed away since the Winter's snow fell. His own work is done. To erect a statue to him in Central Park is simply hanging his photograph upon the green wall of the world ere he bids us farewell. This makes the honor sacred and impressive. While he himself looks upon it, there will be no boast within his heart. He will say, "There is a token of love given me, because God solved in me a mystery by which blessing has come to my fellow-men." Will it not be a glad duty thus to coronate an old man's life whose name is a synonym in all lands for that which to-day unites the whole earth? Is it not a brighter and a better thing than to hail the hero's return from the field of blood, who comes amid darkened homes and anguished hearts?

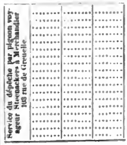
ÆRIAL MESSENGERS.

Correspondence of the N. Y. Tribune.

There was a time, not so many decades ago, when the pigeon was in universal use as a bearer of dispatches; the great gold men and speculators of the Continent used the carrier-pigeon when quick communication of events was necessary, and the European newspaper editors did not despise the puny postal messenger when it brought in the first intelligence of a battle or a horse-race. The European telegraphic agent, Reuter, made good use of them as messengers when the telegraphic communication was establishing between Aachen and Berlin, and a gap still existed between Aachen and Brussels, the birds carrying the dispatches from one city to the other in the space of about an hour.

A few months ago a Belgian provincial newspaper correspondent, sent to Brussels in order to report and transmit at once the King's opening speech in Parliament, was furnished with two carrier-pigeons by which to send home duplicates of his copy. Arriving at the capital, he alighted at one of the hotels, where he gave the bird-cage into the hands of a waiter, and ordered a good breakfast for himself. The meal was soon ready, and as quickly devoured, the correspondent being especially delighted with the taste of two delicate birds. But he was not so well pleased when, after completing his report, he called for his pigeons, and was told that he had eaten them for breakfast. It is the French, however, who have now come to know best the extraordinary value of the carrier-pigeon. Any one can make use of this means of communicating with Paris by payment of 50 centimes per word for letters not exceeding 20 words. These letters, being collected in the provisional capital—Tours, Bordeaux, or wherever this may be—are legibly transcribed upon large sheets of paper, like newspaper columns—this collective letter then being photographically reduced to the most minute dimensions before being intrusted to the bird-post. It is no uncommon thing to hear of 20,000 or 30,000 dispatches being taken by a single bird.

The space into which these messages can be photographically compressed is something wonderful. A whole newspaper page can easily be reduced to the size of an inch square; and a photographic pigeon-post dispatch, when ready for transmission, has the size, shape, and appearance of the following diagram:


Service du dépêche par pigeon voyageur Stoenackers à Merchandier
103 rue de Grenelle

The first column contains the address of the Paris depot. The three other columns contain the dispatches, one following the other, without spaces or other marks. On the reverse, the column corresponding to the address is blank; the other three are full of dispatches like the rest. The mode of transmitting the letter thus prepared is to roll it round the middle feather of the bird's tail, or it is inserted in a separate quill, and attached by thread to the same, thus being no hindrance to the bird in flying. The old method of tying the letter under the wing is no longer adopted. The wings of the pigeons also are stamped with the date and place of departure.

The pigeons used for the carrying of the dispatches are larger than the common house pigeons, being about 15 inches in length, and weighing from 1 to 1½ pounds, and strongly resembling the wild pigeon. While the latter, however, have gray plumage with black wings, the postal pigeon is usually dark-brown or perfectly black. Its breast-muscles are very large and strong, indicating great power of flight and endurance. Most ornithologists are agreed that two elements enable the carrier-pigeon, with its great power of wing, to perform its astonishing journeys—namely, the love of home, and the sharpness of the eye. As soon as a pigeon is released, no matter where taken, it immediately darts upward, circling and constantly enlarging the circle as it ascends higher, getting at last almost beyond the reach of the human eye, until finally, getting the direction of its home, it shoots off with incredible swiftness. A pigeon sent from a floating balloon takes an exactly contrary direction, at first descending perpendicularly earthward, circling as it descends, until it recognises its position. All this is a matter of training and race. To get good, trusty carrier-pigeons, short journeys must be first made when the birds are still very young, these being continually increased until they are able to perform immense distances with certainty and without interruption. Belgium is the land *par excellence* of carrier-pigeons; then Holland, the lands of the Lower Rhine, and the north east of France. Pigeon-"fancying" is in Belgium a passion; the Belgian fancier takes greater pride in his dovecote than probably any other European. Who has not seen him seated on the roof of his house, or at one of the highest garret windows, in the beautiful Summer evening, waiting for the return of his pigeons, which he expects from some towns in France, from Germany, and, indeed, at times, from Italy? His heart almost breaks when one of his favorites is lost. But his pigeons, to his honor it must be said, do generally return. His breed or "race" is pure. He knows what they can do—how far they can fly, and what burdens they should bear. He calls the Parisians "know-nothings" in regard to their pigeons, and cannot understand why, of so many birds that are sent out from the city by the balloons, only so very few return. A writer in the Vienna *Presse* reports a very interesting conversation he lately held with one of the most prominent pigeon fanciers of Belgium, who regretted that he had not taken his stock of birds into Paris before the Germans beleaguered it, as he would certainly have become rich, and his views are shared by the fanciers of Lüttich, Namur, and Brussels, the producing cities of the noblest race of pigeons. This fancier gave some interesting information about the letter-pigeon which shall be here transcribed. A Belgian fancier knows how to treat his birds with care. "The owner of a good pigeon-cote," says our Belgian, "places it at the disposition of the Government, or sells it outright. From this moment the cote becomes an official bureau, in which one or more Government officials must remain. The pigeons are separated into small lots, and those from one cote, or neighboring cotes, are sent on the same journey whenever possible. The balloon takes the lot in a cage, and, after a successful descent, the birds are delivered over to the proper authorities. It depends very much upon the treatment the birds now receive whether or not they make a successful return to Paris. If the Parisians had bred only the celebrated gray-reddish or blue Belgian race, they would not have had much cause to fear about their return. They do not go back so quickly as the balloons came, but quicker than the railroad, and a journey from the Belgian borders to Paris is to them but a little task."

A visit to the Belgian's pigeon-cote is thus described: The cote was a very high one, looking over the curious roofs and houses of the old city, and facing the ancient cathedral. It was a kind of appendage to the roof, and from it a free view was had on all sides, especially upon the roofs of the neighboring houses. The cote contained about a hundred birds, all reddish-blue or blue, most of them with beautiful fiery tinges, a few with black eyes. All were males. A Belgian first-class fancier will not suffer a female bird in the cote. The breeding pigeons are kept separate. The Belgian let loose a dozen pigeons; he then leaned out of the windows, and gave to the birds, which had not dallied a moment on the roof, but were already high above the houses, the direction which they should take by a single motion of the hand. They obeyed with a promptitude that left no doubt of the perfection of their training. He then suddenly closed the window, and, when the birds came to the neighborhood of the roof, he whistled sharp, and, turning round to his visitor, said: "If one of my pigeons settle down upon any other point except upon the trap on my cote-roof, I will screw its neck off." He had scarcely uttered these words when the whole lot flocked home; not a single one had lodged elsewhere. The fancier repeated the experiment ten times, always with the same success. "That is *the* race," he said. "When my pigeons come from the longest journey, they must always keep to the same rules, and they always remember them. I have not killed a pigeon for its incapability now for a long time." There are more than 150 societies or unions of pigeon-fanciers in Belgium alone, and these are connected with branch societies in all countries of the Continent.

The speed attained by the pigeons is from thirty-five to forty miles an hour, therefore, quicker than the average railroad train. Some instances of speed attained may be here recorded. On the 29th of July, 1859, there was a pigeon race from Orleans to Antwerp; at 7½ o'clock in the morning 114 pigeons were released at Orleans, and of these the one which received the first prize arrived at Antwerp at 14 minutes after 1 in the afternoon, the whole distance of 50 German miles being accomplished in five hours and 45 minutes, or about 10 German or 45 English miles per hour. On the 22d of May last two Cologne pigeons were sent up at Pesth, and greetings printed on the wings, at 6 o'clock in the morning. At 5 in the afternoon a telegram came announcing the arrival of the two messengers at 2 o'clock, in a somewhat exhausted state, having accomplished the journey of 125 German miles in not quite eight hours, giving thus a speed of nearly 70 English miles per hour! Not unfrequently birds become exhausted during very long journeys, and are unable to proceed further, or in crossing some regions get into storms, and are destroyed; and especially dangerous is the journey from Italy to Belgium and Holland, the storms of the Alps proving very injurious. A well-trained pigeon never dallies on the journey; never stops to make love on the way—never, in fact, appears to forget his duty. True, some make very agreeable acquaintances before they are sent up for the home journey, and cases are recorded where the amorous instinct and the love of home have had a serious conflict. A Belgian fancier relates an instance of this kind: A bird was separated from its mate and sent up with dispatches; the first day it returned; the second and third day, the same; but on the fourth it soared higher and higher, gained its proper direction, and sped towards home.

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EXPLODING CHARGES BY ELECTRICITY.

Franklin, in 1751, and Priestly, in 1761, suggested the possibility of applying the electric spark for the ignition of gunpowder charges; but electricity was not practically applied until about thirty years ago, by the French military engineers, since which its use has become general. It was employed to ignite the great blasts that destroyed the Round Cliff at Dover, and to remove the wreck of the Royal George, and has been largely used in heavy blasting with powder and nitro-glycerine in California, and for exploding torpedoes under water.

The variety of contrivances is very great. Many exploders have been devised to act either by heating a piece of thin wire, introduced in the circuit of a battery and placed in the charge, or by the passage of a spark produced by an electromagnetic machine, or Ritchie coil, through a sensitive explosive compound, thus causing a local explosion sufficient to ignite the whole charge.

Among those who have given great attention to this subject, Baron Von Ebner, of the Austrian military engineers, and Mr. Abel, of the British war department, who has devised one of the best exploders known, may be specially mentioned. A spark, generated by revolving magnets, is made to pass through a mixture of subphosphide and subsulphide of copper and chlorate of potash—materials of high conducting power, and extremely sensitive to the spark. One of the great difficulties in the way of making such exploders is the liability of the materials to be merely thrown aside, and not exploded, by the passage of the spark.

In the United States, inventors have been active in devising different forms of apparatus for igniting explosives. They all depend upon either the direct passage of a spark or the heating up of an imperfect conductor, immersed in an explosive mixture. This mixture and the arrangement of wires are inclosed in a small cartridge of paper or wood, which can be readily placed in the midst of the powder, in the hole to be exploded. Mr. Stowell patented, in 1862, a peculiar form of cartridge, containing the ends of the conducting wires and a strip of platina. Beardslee, in 1863, patented a very simple mode of making an imperfect conductor between the ends of two wires, by drawing a pencil mark of graphite upon the surface of a piece of dry wood. Mowbray, in July, 1869, patented an improved electrical fuse for exploding charges of nitro-glycerine. It consists of a small cartridge of powder, in the the top of which is placed a small quantity of a composition, like that used by Mr. Abel, made of sulphide of copper, 9 parts; subphosphide of copper, 2 parts; chlorate of potash, 3 parts; the whole intimately mixed. The ends of the wires are immersed in this mixture. It is designed especially to be inserted in cans of nitro-glycerine, to be exploded in oil wells.

The dealers in the new explosive compounds, such as nitro-glycerine, dynamite, and dualin, furnish exploders especially designed for the several preparations. These various exploders may be fired either by the voltaic current, or by a spark from a suitable electrical machine, or the Page coil.—*Mining Machinery.*

THE PACIFIC SUBMARINE CABLE.

REPORT OF THE NEW YORK CHAMBER OF COMMERCE COMMITTEE.

The Committee of the Chamber of Commerce charged with the subject of Telegraphs and Postal Affairs, of which Samuel B. Ruggles is Chairman, reported on the 20th of December last the following resolution, which was adopted:

Resolved, That the Chamber of Commerce of the State of New York regard a well regulated system of telegraph, by sea and by land, as a matter of primary importance to the interests of this country and of the world, and respectfully ask that Congress may pass, at an early day, such laws as will, without creating any monopoly, facilitate the laying of a submarine cable across the Pacific Ocean, from the western coast of America to the eastern coast of Asia, thereby completing, with the lines now in operation, and with those soon to be laid, telegraphic communication around the world.

The Committee now report upon: (I.) The locality and length of the telegraphic lines already established, and of those which are still needed to complete a communication around the globe. (II.) The influence of the work, when completed, upon the commerce of the world, and especially the commerce on the Pacific and the Indian Oceans.

LOCALITY.

The telegraph line, when completed, will necessarily embrace the 360° of longitude encompassing the globe. This great circle is divided in two segments, unequal in length, but each containing a continent and an ocean. The Western embraces the Western Continent and the Atlantic Ocean, extending from San Francisco, in California, to Valentia, in Ireland, over 112° of longitude; while the Eastern embraces the Eastern Continent and the Pacific Ocean, extending from Valentia to Shanghai, in China, over 132° of longitude, and thence across the Pacific Ocean over the remaining 116°, thus completeing the entire circle of 360°. Of these two segments of this great terraqueous line, the Western, from San Francisco to Valentia, has been finished largely, if not mainly, by the energies of the citizens of the United States. Of the Eastern segment, the portion crossing the Eastern Continent is now nearly completed. Two continuous lines extend eastwardly from Valentia, one inclining to the north through the United Kingdom, Germany, European and Asiatic Russia, to the present temporary terminus at Kiachta, an important Russian entrepot in Eastern Siberia, near the Chinese frontier, in north latitude 51°; while the other pursues a southeasterly course through France, Austria, Turkey, Persia, and other Asiatic countries, to Bombay, in Hindoostan, and thence by way of Ceylon to Singapore, only 1° 30′ north of the equator. Kiachta is 116° and Singapore 113° east from Valentia. The land line through Turkey and Persia being liable to occasional interuption in regions only partially civilized, a submarine line has also been laid from Italy through the Mediterranean Sea, the Red Sea, and the Arabian Sea to Bombay.

By the lines above described commercial and other messages are now regularly telegraphed, without interruption, from London to Kiachta and Singapore. Through the commercial house of A. A. Low & Brothers of New York, largely engaged in the trade of China and Japan, the Committee have ascertained that the extension of the submarine cable from Singapore to Hong Kong, about 1,400 miles, and thence to Shanghai, about 1,000 miles, is in active progress. By a letter recently received by Mr. Cyrus W. Field and exhibited to the Committee, they are informed that the line from Singapore to Hong Kong will be laid by the first of May, and be in actual operation by the first of June next. An Australian line will be completed to Singapore within the present year.

Two telegraphic lines under the Pacific have been suggested to the Committee:

One commencing at San Francisco, in latitude 37°, and deflecting southwardly to the Sandwich Islands, in latitude 20°, and thence inclining northwardly, by way of the Midway Island, in latitude 27° north, to Yokohama, in Japan, in latitude 35° north, and thence southeasterly to Shanghai, in latitude 32°. Its length will be 5,430 nautical miles from San Francisco to Yokohama, and from Yokohama to Shanghai 1,085 miles—in all 6,515 nautical miles. The other and more northern line will extend from San Francisco along the coasts of British Columbia, Alaska, and the Aleutian Islands, to the eastern coast of Japan, and thence to Shanghai.

The report considers quite at length the influence of a Pacific Cable on the foreign commerce of the world. The total foreign commerce of the European and American nations, in which is included all their commerce with the Asiatic countries, consists as follows: Commerce of the European nations, $7,203,390,415; that of American nations, $1,640,822,697; total, $8,844,213,112. The aggregate value of the commodities actually moved is one-tenth of the $8,844,213,112, or $884,421,311, and one-half of the residue, $7,959,791,801, being $3,979,895,901; the total is $4,864,317,212. The commerce of the Pacific and Indian Oceans is next considered. From the detailed statements in the table the following general facts will appear:

(1.) Of the commerce of Europe and America with Asia, on the Pacific and Indian Oceans, being, in 1868, $735,141,550; the three maritime powers, the United Kingdom, France and the United States, had $672,108,550, and (2) their commerce on those oceans in 1854 was $330,079,742, showing an increase in the 14 years of $342,028,808, being 103 per cent. or 7.35 per cent. yearly. (3.) From the proportion of exports to imports shown by the tables of the three nations, we may safely estimate that of the total commerce of $735,141,550 the exports to the Asiatic countries did not exceed $300,000,000, so that the imports from these countries were at least $435,141,550. (4.) Of the last named amount, Australia and New Zealand furinshed $62,942,240, and the more tropical countries of Asia the remaining $372,199,310. It is this last portion which imparts to the commerce on the Pacific and Indian Oceans its peculiar interest.

The conclusions to which all these facts lead the Committee are in brief, these: It surely requires no great stretch of imagination or credulity to believe that a commerce so beneficent and civilizing, in a world like ours filling up with people so rapidly, is destined to large and speedy increase, especially if wisely aided by our National Government. It is not for the clear-headed, far-sighted merchants of the United States to close their eyes upon the fact that, in the providential march of events, a field so vast is just opening to their well directed energy. The products of the globe will take the shortest and cheapest road to market. San Francisco will be the entrepot for a vast part of the Oriental trade, and should therefore be speedily put in telegraphic communication with the continent of Asia.

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Madras and Penang Telegraph.—Upwards of eighty messages were dispatched from and received at Madras on the first two days after the opening of the Madras and Penang telegraph line. The Indian Government is about to erect an additional wire between Madras and Bombay in anticipation of the utilization for business of the cables to China and Australia.

REGULATING TIME.

Among the uses to which the electric current can be with great facility and economy applied, is the regulation of time. A single clock in the city of New York can, by the simplest of devices, regulate the clock-hands of all the clocks on every spire or tower in the city. These clocks—all except the regulating one—need no machinery beyond a simple wheel, a ratchet catch, a magnet, a set of hands, and a dial. Experience in the constitution of batteries, by which they are made both inexpensive and constant, is rapidly preparing the way for all these applications, and on important railroads wires will yet be strung to give synchronous time to every station and to intermediate posts. Automatic processes can be applied also for recording the passage of trains over certain points, and thus exhibiting in the superintendent's office the progress of each.

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AN OPERATOR HONORED.

Mr. Fowler Bradnack, who will be remembered by many as formerly connected with the office of the New York, Albany and Buffalo Telegraph Company in Buffalo, and whose memory is pleasant to us as his superintendent, has just graduated honorably and with marked favor, in the University of Buffalo, N. Y. Hon. Millard Fillmore, chancellor, presented him with his diploma, and conferred upon him the degree of Doctor of Medicine. So *Mr.* Bradnack is no more, and in his stead is Fowler Bradnack, M. D., or Dr. Bradnack, to whom we respectfully and with congratulations, bow. Special thanks were given by the Faculty to Dr. Bradnack and an associate, for their clinical reports during the winter. The craft thus loses one of the best of operators, whose operations hereafter will be in Bridgewater, N. Y., where we wish him much success.

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PRESENTATION.

We omitted to mention, at the proper time, that Mr. Chas. F. Stumm, the gentlemanly manager of the Cleveland Western Union office, was presented on Christmas last with a beauiful silver tea service, consisting of six pieces. Mr. Manning made the presentation in a neat address. Mr. Stumm returned his thanks in a manner that showed how much he appreciated the unexpected expression of esteem thus shown him. Friends and readers of *Demorest* will find an excellent illustration, together with a description of the "set" in the January number of that magazine.
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OBITUARY.

At a meeting of the Telegraphers of Chicago, Feb. 26th, the following preamble and resolutions were adopted, as a mark of respect to the memory of William F. Altemeyer, a telegrapher, for many years employed in the Western Union office of this city, who died of consumption, at Freeport, Illinois, on the 24th inst.:

Whereas, On the twenty-fourth inst., it was the will of Almighty God to remove from among us Mr. William F. Altemeyer, and

Whereas, Mr. Altemeyer, by long and agreeable associations, by his patience in adversity, by his genial ways, even while suffering the ravages of fatal disease, had won the admiration, respect and lasting friendship of all who knew him. Therefore, be it

Resolved, By these friends assembled, that we record here our deep grief that he has so early left us. That we shall nevermore daily see him in his accustomed place. And further

Resolved, That, to his wife, little children, widowed mother and kindred, we offer expressions of the heartfelt sympathy we feel for them in this hour of their sad affliction.

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In Worcester, Mass., they have a fine quartette club called the "Yo Semite," composed largely of the Western Union Telegraph operators of the various offices in that city.

MONTREAL TELEGRAPH SNOW-SHOE CLUB.

About the beginning of the present winter the employees of the Montreal Telegraph Company's Office in Montreal, at a meeting called by a few lovers of the sport, formed themselves into a Snow-Shoe Club, when the following officers were unanimously elected: James Dakers, Esq., Sec. Montreal Telegraph Co., Honorary President; Angus Grant, President; J. S. MacKenzie, Vice-President; W. Matthews, secretary and treasurer, and a committee of three. It was then resolved that they should go out for a tramp every Friday evening (after the night force had arrived), and that the club should be known as the "Montreal Telegraph Snow-Shoe Club." Since then they have gone out "Indian file," headed by their worthy President, to whom they are deeply indebted for many reasons, regularly every Friday evening. Let us follow them from their starting point, McGill College Gate, over the College grounds, up the side of the mountains, through trees towering aloft in the clear frosty air, gazing at the star-dotted canopy of the heavens. Once they turn to give a farewell look at the bustling city, dotted with its many spires shining in the clear moonlight like so many mirrors; now they reach the summit known as the "Pines." Here it is their custom to wait until those, who, through want of wind or by misfortune, have been left behind. The last man is heard "all up," when down the mountain side they fly. Occasionally one not so expert as the rest gets "wrong side up without care," but seeing the "Graveyard" a short distance ahead, through which he has to pass, soon "adjusts" himself and puts forth his muscle, and does his best to keep near the crowd through the tombs; now they near the "Bellevue Hotel," their turning point, having made the distance in from 25 to 30 minutes, where, according to previous arrangement, hot coffee, cold meats, &c., are in readiness, and to which all do ample justice. Let it be remembered that their first by-law is, "that this Club will be conducted on strictly temperate principles," and, from what I learn, this rule has been strictly adhered to. Supper over, dancing and singing commences, which is kept up until the voice of their leader announces, "Time's up," when "God Save the Queen" is struck up, and once more they strike out, homeward bound. On Friday, 27th ult., the Club had their first steeple-chase over the mountain, a distance of about three miles. Sixteen started. First prize, a neat little dressing-case, was won by W. Mawer, operating department, in 23 minutes 58 seconds; second, by Mr. Scott, treasurer's department; and third, by Mr. Adams, receiving department. The fourth prize, being a "leather medal," was won in 28 minutes and 47 seconds, and was presented to its winner amidst deafening cheers. This is nearly as good time as is made by the best Club in the city. On Monday evening, the 30th ult., the Club tramped out to Longue Point, calling at View Bank, the residence of their honored president, where, after partaking of the delicacies so lavishly bestowed upon them, were joined in the drawing-room by a few of the fair sex (friends of the fraternity), whose presence and affability did not fail to make due impression on the minds of those present. Dancing and singing being a part of the programme, the large room floors were soon filled, and for a while the clicking of the instruments was entirely forgotten in the whirl of the waltz, polka, &c., to the music of the piano. The small hours having commenced, the company formed around the room. "Auld Lang Syne" was sung, when, snow-shoes being strapped on, the Club, with three most enthusiastic cheers for their host, three for their hostess, and three for their President, started off with grateful remembrances of their first snow-shoe tramp to View Bank. I believe there is nothing particularly new in the operating room, except the boys are getting up their muscle for the coming session of parliament, and we feel certain that they will acquit themselves as well as they have done heretofore.

Yours, SNOW-SHOE.

◆

ANSWERS TO CORRESPONDENTS.

Where we have instructions to take half rate messages for points on other lines, are we to take them at half rate to their destination, or half rate to the point where they leave this line, and full rate for other lines?

In all cases where half rate messages are received at stations on our lines for transmission, the half rate is to be charged to their place of destination. Receiving stations are obliged to deliver all messages, whether paid or free. If free messages are improperly sent to any office, the manager should report the matter to his superintendent.

Will you please inform me through the JOURNAL whether the electric spark, as exhibited at the local connecting points of a relay, would appear if the points were placed in a perfect vacuum

We cannot answer this question from personal observation, but can state, on the authority of the late Professor Page, that the spark from a single cell of battery is exhibited in vacuum without apparent increase. He also states that the effect would probably be much increased from a number of cells, on account of the absence of oxygen. The spark arises from the rupture of the secondary or induced current, generated by the primitive current, and is said to be rendered much more brilliant when broken over mercury.

◆

A NOVEL AERO-STEAM MOTOR.

The London *Mechanics' Magazine* describes a new motor, known by the somewhat romantic title of the "White Cloud" engine, and embracing a novel method of combining air and steam in the evolution of power. The air is forced into the apparatus by a series of pumps—in the first to a pressure of three atmospheres; in the second to six; in the third to twelve, and in the fourth to twenty-four. In its transfer from one pump to another, the air is passed through water, and at each stage absorbs a quantity of moisture. From the fourth pump the air passes to a receiving-chamber, from whence, in a thoroughly saturated condition, it goes to a coil provided in a heating chamber; the aeriform mass forming the white cloud from which the engine is fancifully named. The passage of the cloud through the heating-coil results in the conversion of the water into steam. From the heating-coil the mingled air and steam are conducted to the cylinder of the engine.

The small engine used in testing this novel method of combining air and steam in the production of motive power gave an effective power equal to that of four horses, with an expenditure of two and one-half pounds of fuel per horse-power per hour. Its cylinder has a diameter of four and three-eighths inches, and a piston stroke of six inches. Whether a large machine will yield results proportionally advantageous remains to be seen, but the compactness of the apparatus and the dispensing with a boiler properly so-called are certainly points in its favor. The united use of air and steam seems to excite much interest among mechanical engineers, and we trust that the system of compressing the two for combined use, first proposed, we believe, by W. Mt. Storm, of New York, a score of years ago, may yet, under some conditions at least, result in the production of a motor in which the more objectionable features of the steam engine may be avoided.

EUROPEAN AND AMERICAN TELEGRAPHS.

While the Continental system is greatly superior to the American in some respects, in others it is decidedly inferior.

London, where a large number of new offices have been recently opened, is the only place in which the facilities will compare with ours. It has 285 offices to a population of nearly 3,500,000, while New York, with 900,000, has about 75 offices, and transmits daily many more messages, in proportion to population, than London. Paris, with a population of over 1,000,000, has 50 offices; Berlin, with a population of 750,000, has 18 only; Philadelphia, with 650,000 population, has 81 offices; Brussels, with over 300,000, has 5 offices; while Boston, with a less population, has more than 20.

Belgium excels all other nations in the promptness with which telegrams are transmitted. Half an hour is the average time between the reception and delivery of a message. The average time in North Germany is about three hours; in England, about one hour. In America, the average between the large cities is probably no more than in other countries, excepting Belgium; but for other messages a much longer time is required.

The Commercial News Bureau, which transmits daily reports of the markets to the merchants of our large cities, is peculiar to this country. The large mercantile houses of Great Britain depend upon daily telegrams from their correspondents for the news of the markets; and on the Continent such telegrams are sent only in exceptional cases, when the fluctuations are great.

The facilities enjoyed in this country by the merchants' exchanges, brokers' boards, bankers, and a few other special classes of business, are entirely unknown on the Continent, and are precluded by the present laws of Great Britain.

Abroad, the telegraph is used more for social intercourse and less for business than here, and the business is much more uniform through all hours of the day, and is not chiefly confined to banking hours, as with us. Extra rates are charged for night messages there; here, half rates.

No special privilege is afforded to the press on the Continent. They pay full price, and use the telegraph but little. The average daily number of words transmitted to the press in Berlin in October, 1870, was only 300, which included the news from the seat of war. The greatest number ever transmitted in a day was 1,800. Ten times as many have been sent in this country.

From the Report of G. W. Hubbard.

◆

PROMOTION.—The friends of Mr. I. W. Copeland, formerly operator in the telegraph office at the Vergennes Depot, Vt., but for some time engaged in the Brandon office, will be pleased to learn that he has received the appointment of Superintendent of the Dutchess County Telegraph Co., at Fishkill, on the Hudson river, N. Y.

◆

BORN.

Born to T. L. Prescott, Manager of Western Union Telegraph Office, Clifton, Ia., Feb. 22d, a son. Observe the date of this important event. Hurrah for George Washington Prescott.

To James E. King, operator Ches. & O. Railroad, Greenwood, Va., a son on Feb. 22.

◆

MARRIED.

PURDY—CONKLIN—At Nyack, on March 8th, at the parsonage, by the Rev. Mr. Opdyke, Isaac M. Purdy, manager of W. U. Telegraph Office, to Miss Emma Conklin, all of Haverstraw, N. Y.

FORDYCE—SULLIVAN—Feb. 7th, 1871, at the residence of the bride's parents, by the Rev. Mr. Ellison, Mr. Geo. W. Fordyce and Miss Saidee Sullivan, of Millwood, Ohio. Mr. Fordyce is now operator for the B. & O. R. R., at Zanesville, Ohio.

THE SERVICE.

WESTERN UNION TELEGRAPH COMPANY.

PERMANENT APPOINTMENTS.

J. A. Burkholder	operator	141 Broadway, N. Y.
F. Carry	operator	145 Broadway, N. Y.
Miss S. F. Davis	operator	Coleman House, N. Y.
D. W. McAneeny	operator	145 Broadway, N. Y.
Miss V. Mansfield	operator	145 Broadway, N. Y.
Mrs. S. P. Chisholm	operator	Liverpool, N. S.
E. A. Leonard	operator	Apohaqui, N. B.
E. H. Smith	operator	Mattawamkeag, Me.
A. D. Brewer	manager	Ashburnham, Mass.
T. R. Miller	manager	North Pownal, Vt.
N. J. Sargent	operator	Concord, N. H.
S. H. Eldridge	operator	Duxbury, Mass.
Lewis N. Thomas	operator	Ridgefield, Conn.
B. R. Bates	operator	Washington, D. C.
Sarah E. Christie	operator	Minersville, Pa.
B. A. Falmer	operator	L. and P. Junction, Pa.
W. H. Huxford	operator	Washington, D. C.
Jennie Marks	operator	Lewistown, Pa.
Crever Mann	operator	Tyrone, Pa.
John McCarty	operator	Scranton, Pa.
C. T. Maloney	operator	Tamaqua, Pa.
Charles Moore	operator	Philadelphia, Pa.
Thos. H. Snowden	operator	Belair, Md.
C. P. Tunnell	operator	Georgetown, Del.
Thos. S. Williams	operator	Millville, N. J.
Charles Lawson	operator	Elmira, N. Y.
George A. Putnam	operator	Elmira, N. Y.

TRANSFERS.

Miss L. P. Pine	operator	City Dep't, N. Y., Manor, L.I.
Thos. E. Smith	operator	Anagance, Rothsay.
Jas. Ryan	operator	Apohaqui, Anagance.
S. W. Eldridge	operator	Portland, Me., Duxbury, Mass
E. J. Fullam	operator	Boston, Mass., Duxbury, Mass.
L. A. Sherman	operator	Duxbury, Mass., Boston, Mass.
C. A. Parsons	operator	Oswego, N. Y., Utica, N. Y.
Chas. A. Bigler	operator	Scranton, Pa., Harrisburg, Pa.
Peter Lee	operator	Tyrone, Pa., Shamokin, Pa.
Fred. W. Tunnell	operator	Georgetown, Del. Norristown, Pa
Chas. Lawson	operator	Elmira, N. Y., Corning, N. Y.
D. W. McAneeny	operator	Elmira, N. Y., New York, N. Y.

RESIGNED.

Geo. Clarke	operator	145 Broadway, N. Y.
W. J. Cundall	operator	145 Broadway, N. Y.
W. A. Toft	operator	145 Broadway, N. Y.
J. A. Wolfinger	operator	Board Brokers, N. Y.
B. R. Bates	operator	Plaister Cove, C. B.
Mrs. Corning	operator	Liverpool, N. S.
H. A. Sheridan	operator	Nashua, N. H.
C. E. Cheesebro	operator	Syracuse, N. Y.
R. A. Gager	operator	Rochester, N. Y.
E. S. Champion	operator	Millville, N. J.
Wm. E. Day	operator	Harrisburg, Pa.
Mary Marks	operator	Lewistown, Pa.
S. R. Riddle	operator	Norristown, Pa.
J. E. Shreve	operator	Wrightstown, N. J.
N. J. Synder	operator	Philadelphia, Pa.
Geo. F. Stewart	operator	Washington, D. C.
E. R. Kalbfus	messenger	Port Jervis, N. Y.
J. F. McAuliff	messenger	Binghamton, N. Y.
M. P. Jordan	messenger	Grafton, W. Va.

◆

DETROIT & MILWAUKEE RAILROAD,
Telegraph Department.

DEAR JOURNAL: The following changes and appointments have been made on this line: H. Anderson, Manager, Holly office, to Detroit, Train dispatcher *vice* W. E. Smith, relieved; W. R. Thomson, manager, Holly office; W. J. McMaster, of Pontiac, to Nunica, as agent and operator; S. K. Taft, of Owosso, to Pontiac; A. Armstrong to Owosso.

Yours truly,

ANGUS FOX.

◆

THE FOREIGN CABLE BILL.

The act relating to telegraphic communication between the United States and foreign countries, although presented to the President in time, failed to receive his approval, for the reason, as stated, that it did not secure to our citizens the reciprocity of laying cables in foreign waters. It is certain he read the bill, but withheld his signature.

◆

TELEGRAPHY IN SOUTH AMERICA.—A commencement has been made with a line of telegraph from the Argentine Republic to Chili across the Andes. The new line will meet another telegraph wire at Valparaiso, which will soon be prolonged to the Isthmus of Panama, and thence to the telegraphic system of the United States.

◆

WE REGRET that the Porto Rico cable is, up to the present date, still unrecovered. Sir Charles Bright is doing all which is possible to restore it, but the difficulties are unusual and perplexing. A rocky bottom renders grappling by steam impracticable, and this makes the labor great and fatiguing. The laying of these Carribean cables has been, thus far, most expensive and unfortunate.

THE ENGLISH TELEGRAPH CONSTRUCTION AND MAINTENANCE COMPANY.

The outside admirers, or rather, the speculators, in the Construction and Maintenance Company, appear to have been disappointed with a dividend of only 20 per cent. per annum, and a bonus of only 25 per cent. We believe that the company is acting prudently in retaining the larger portion of its profits, and we doubt not that the accounts will be satisfactory to the permanent investors. We are glad also to learn that the prospects of a continuance of profitable business are better than seems to be generally assumed. The idea of laying a fourth cable as the joint property of the two American companies, out of funds raised by debentures guaranteed by their whole property is a good one, and likely to be carried out.

The gross income of the two companies is now about £500,000 per annum, and with another cable it might be largely increased. But, without any increase, the company could well afford to give £60,000 a year for interest, and £30,000 a year for redemption, and still pay 10 per cent. dividend to the shareholders. A dividend of 10 per cent. with the security of four cables will make the shares at as high a premium as they are now at a discount. We hope to see this new cable accomplished in the present Summer. Although we hear that the new projected cable company is not prospering, it will be well if the existing companies disregard the temptation to that fertility of new enterprises which, a short time since, created so much speculation and caused so much disappointment to the public.—*Railway News.*

◆

A FACETIOUS OPERATOR.

To the Editor of the Journal of the Telegraph:

We overheard a conversation on a railroad line not far from Pittsburgh, the other day, which we give in full. It appears that the "day operators" had gone out without permission, and the general office had some trouble with the night operator, who "had the chair" in his absence. On his return, the following conversation took place:

General office—Where have you been?

A. I have been "where the woodbine twineth."

G. O.—Who gave you permission to go out?

A.—A party by the name of Johnson.

G. O.—You must have got away a good piece, as night man couldn't find you?

A.—Yes, I got away with a good piece of steak while gone.

G. O.—I have had this Richmond business for two hours.

A. Then methinks there are six Richmonds in the field, for five have I slain already.

G. O.—Your replies will be the cause of your dismissal.

A.—Then, Othello's occupation's gone!

G. O.—You are incorrigible.

A.—In-co-who-able?

"Pony" still holds his position.

Q.

◆

CITY PRINTING TELEGRAPHS.

In no direction is there a wider field for enterprise than in the provision of machinery for local telegraphs. Their success in New York is very marked. They must come into extensive use in all cities. They cannot now be made as fast as ordered.

Two additions to these are before us. One is the invention of our friend D. Flanery, Esq., New Orleans, who has produced an effective one wire printer, worked with two keys. The elements in this instrument are very simple, and not unlike the Edison. The other is a one wire printer by G. M. Phelps. In this a key board is used needing a single deflection for each letter, and can be worked with both hands. A spring carries the machinery on, which needs to be wound up only once in half an hour, and requires only an instant to wind. The action is therefore very simple. No education is needed save the ability to read the alphabet, and no skill except what is used to depress a key. They are bound to come into general use, and are furnished on application, by the Western Union Telegraph Company, who own the patent, at a moderate price.

◆

AN OPERATOR at a city, for the present nameless, is thus reported by the office manager:

"——lost since Christmas, appeared this P. M. tangle-legged, round-shouldered, blear-eyed, and tongue-tied. Undoubtedly met with a tidal wave. Soon as he can understand the point will give him a ticket of leave."

Oh, Rum! thou art a hard master to some men.

TELEGRAPHS IN GREAT BRITAIN.

Returns "showing the Numbers of Clerks and Messengers employed by all the Telegraph Companies transmitting Messages within the United Kingdom prior to the Transfer of the Telegraphs to the Post Office:"

"Showing the Number of Clerks and Messengers employed by the Post Office on the 31st day of July, 1870:"

"Showing the Mileage of Telegraphic Wire employed in the transmission of Public Messages before the Transfer, and on the 31st day of July, 1870:"

"Showing the numbers of Single Needle, Bell, Printing, Hughes, and Automatic instruments employed in the transmission of Public Messages before the Transfer and on the 31st day of July, 1870:"

"Showing the number of Telegraph Offices of all kinds open in the United Kingdom prior to the Transfer, and the number open on the 31st day of July, 1870:"

"And, showing the Average Weekly Number of Messages Transmitted by the combined companies before the Transfer, and the Average Weekly Number Transmitted by the Post Office during the month of July,"

		Employed by the Telegraph Companies prior to the Transfer.	Employed by the Post Office.	Date to which the Return is made up.
Number of Clerks		2,514	4,918	31 Aug. 1871
Number of Messengers		1,471	3,116	31 " "
Mileage of Wire		51,311	68,319	31 " "
No. of Instruments	A. B. C.	30	106	31 " "
	Single Needle	644	2,207	31 " "
	Bright's Bell	298	478	31 " "
	Printer*	808	1,191	31 " "
	Hughes	6	29	31 " "
	Automatic		38	31 " "
Number of Telegraph Offices		2,150	3,907	8 Feb. "
Average Weekly No. of Messages		130,736	214,085	31 July "

The return showing the number of Instruments used by the Telegraph Companies and the Post Office, includes instruments in use, and also instruments kept in reserve for the purpose of replacing disabled instruments.

General Post Office, 8th February, 1871.

FRANK IVES SCUDAMORE,
Second Secretary.

* Morse.

◆

ELECTRO-MAGNETIC ENGINES.—*J. F. Wiles.*—The inventor arranges a series of magnets upon or around a disk or wheel, within or around which is a keeper or keepers. The magnetic disk or wheel and the keeper or keepers may be of a circular or of other desired shape, such as an octagon or nonagon, but in all cases the magnetic disk or wheel and the keeper or keepers are made with only a small amount of difference in size, so that as the magnetic disk or wheel revolves, the magnets shall always be within a short distance from the keeper or keepers, in a similar manner to the differential gearing now employed for various other purposes.

◆

HYDRO ELECTRIC CABLE.

This is the invention of F. Tomasi, of Paris, France. The cable is composed of one or several pipes of copper or other convenient material, equal in number to that of the despatches it may be desired to transmit simultaneously. Each pipe leads respectively and separately at one end into a little cylinder provided with a piston, and at the other end into a bent glass tube which contains some mercury. A platinum wire, isolated everywhere except at its extremity, which is always immersed in the mercury contained in the tube, is in communication with a terminus or screw nut. Another wire, also of platinum, which can be immersed more or less deeply into the mercury in the glass tube at will, is connected to another similar terminus, and a third wire, also of platinum, isolated everywhere except at its end, is in contact with a third terminus. The last wire is immersed in the glass tube, so that its uncovered end can only come in contact with the mercury at its upper level. The second mentioned terminus is put in contact with the receiving apparatus, and the latter with the pile, which in its turn is connected with the first mentioned terminus.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,

Executive Rooms, Western Union Tel. Co.,

145 Broadway, New York.

NEW YORK, MARCH 15, 1871.

THE TELEGRAPH IN GREAT BRITAIN.

The returns of the British Postmaster General to the House of Commons, in answer to certain inquiries made of him in reference to the working of the telegraph under his direction, have been placed in our hands. The statement of receipts and expenses are not shown, but are clearly enough indicated by the items before us. The following are the details, which are stated in connection with results under private management prior to the passage of the lines under Governmental control, so as to admit of easy comparison:

1. The number of telegraph offices in Great Britain prior to the transfer of the telegraphs to Government was 2,159, averaging each 10 messages per day.

Number of offices now open at the close of the year, since Government took control, 3,907, averaging 9 messages per day.

In accomplishing the increase in the number of offices indicated by these figures, 12,000 miles of wire were added to the former lines. The cost of doing this is not given. So far as the report goes, it shows that, by the use of ample means, Government has brought into telegraphic connection a large number of towns during the year, but with an apparent reduction in the average transmission per station of one message each per day. Even admitting, what is no doubt true, that from many of the new offices the transmission of messages was small, the result is not indicative of any such enlarged use of the wires under their new master as we were asked to expect.

2. The number of clerks, including operators, receivers, bookkeepers, &c., in the employ of the companies prior to the transfer, was 2,514, by whom an average of 8⅗ messages each was transmitted daily.

Under Government, this force has been increased from 2,514 to 4,913, whose average work is 7½ messages each per day.

It is not difficult to see that if ten persons are necessary to do the work which nine did formerly, and the charges for doing that work are lessened, there must necessarily result a large comparative loss. However that may prove to be, the cost of transmission has been evidently increased, the average transmission per office lessened, and the rate lowered. The rule of three will show the result. It is not brilliant.

3. The number of messages delivered by private companies averaged 15 per messenger per day.

Under the Government, the average is 11½. As many of these messengers receive no pay, and are the children of the country postmasters, or school children honored by a temporary Government commission, we ask no questions as to why messengers do less work for the Crown than for the company.

4. The staff of the service, *i. e.*, the number of clerks, operators, &c., employed under the companies, averaged 1 1-6ths to each office, whose work was equal to 7½ messages per man per day.

Under Government, the average force is 1¼ clerks to each office, with an average work of 6 messages per day, *i. e.*, more men doing less work than formerly.

What shall we say to this report? In what has Government advanced the status of the telegraph in the British isles? We do not think that we need hesitate long in making the reply. Government has, by a free use of money, opened many new offices; has strung much wire, and employed many people; the cheapening of its press rates has induced increased employment of it by the press; but there is no evidence of any enlargement of its general use by the reduction of the tariff, which was not equally, if not more, apparent in the annual increase under the management of the companies.

In reviewing the Government statement, the *Pall Mall Gazette* uses the following language, with which we close this notice:

> The figures which we have quoted do not give us a very high idea of the usefulness of the new department. The Post Office has not been trusted with one message for every three persons. When we remember the exaggerated conceptions of the probable utility of the new office which were formed only a year ago, we are forced to the conclusion that the results have fallen lamentably short of the anticipations of its promoters. The fiscal effects of the scheme are less easy to discover; but it is, nevertheless, possible to form some conclusions on this point. From the 6th of February to the 2d of April we know that 1,297,100 messages were forwarded; and, adding to this number those which were probably sent before the first of these dates, of which no record has been published, we may assume that about 1,830,000 messages were transmitted in the remnant of the financial year 1869-70. That business produced a revenue, according to Mr. Lowe's budget speech, of 100,000*l.* Since the 2d of April 8,263,227 messages have been despatched, and, according to the same computation, the revenue arising from them ought to have amounted to upwards of 600,000*l.* But the actual receipts paid into the Exchequer have only hitherto reached 450,000*l.*, and we are consequently driven to the conclusion that the receipts on the first commencement of the undertaking were, either from payments in advance by large commercial firms, or from other causes, unusually large, and have not, at any rate, been sustained during the present year.
>
> The expenditure of the department has been, at least, as large as Mr. Lowe anticipated. It consists, first, of the actual cost of the business, estimated to amount to 360,000*l.*, which, as that sum has already been reached, will probably be exceeded; and, second, the interest of the stock created for the compensation of the private companies whose business Government acquired, involving an annual charge of 210,000*l.* To these items might possibly be added the sum, a little over 100,000*l.* (credited to the Consolidated Fund), for the partial extinction of the telegraph debt. It is certain, therefore, that the new business has involved this year an expenditure, under these three heads, of more than 670,000*l.*, and it is probable that, as the cost of the business for another seven weeks has still to be defrayed, this outlay will ultimately be raised to at least 730,000*l.* Against this we have to set a revenue which has hitherto only amounted to 450,000*l.*, and which will not apparently ultimately reach more than 600,000*l.* Whatever verdict may be pronounced on the telegraphic business of the Post Office, it is apparently impossible to assume that it has proved commercially a success.

ARRESTS BY THE MORSE TELEGRAPH.

Some time ago we had an account from San Francisco of a robbery by a Chinaman, who eluded arrest by embarking, with his plunder, for Hong Kong, fully convinced that he was safe beyond the reach of justice.

A telegram, however, from San Francisco to New York, thence to England, and thence by telegraph to India, and finally to Hong Kong, prepared the officers of the law for the reception of the culprit at the dock; and on the arrival of the vessel from San Francisco, we may imagine the astonishment of John Chinaman on finding that a full knowledge of his crime and a description of himself had, in some mysterious manner, preceded him, and that he had fled in vain from justice.

A classical friend, in view of this fact, insists that Horace must have had a prophetic vision of Morse's telegraph, when he wrote in Book III., Ode II., the following line:

> *"Mors et fugacem persequitur virum."*

which he thought might be liberally and justly rendered—

> *Morse, too, overtakes him who runs away!*

◆

It is known that not long since the cable between Lisbon and Gibraltar was disabled. After considerable labor, it was grappled on February 11, in 500 fathoms water. At that depth the ocean is generally supposed to be at rest, and that currents cease below 200 or 300 feet from the surface. When brought to the deck of the repair ship, however, there appeared on the cable most evident indications of chafing of very heavy character. We believe this to be the only case of abrasion at such a depth known, and is important to those who study the geography of the seas, inasmuch as the chafe of the cable indicates the existence of a powerful ocean current at a depth of 3,000 feet along the Spanish or Portuguese coast.

◆

The *Scientific American* says that our "wildly enthusiastic article" on magnetic motive power, "has excited very great interest in the public mind, has been extensively copied and widely read." We have observed this fact both among our own and the English standard papers, but the *Scientific American* has been the only one to call us "wild." We stated what we saw, and gave results which can be sworn to. We believe time will answer all suspicions, and we leave this new motor to that alembic. We wrote for no man's benefit that article on "Magnetic motive power," and we read it to-day from the London *Chemical News* satisfied with our work. To our mind the possibilities of magnetism are just being born. The exhibition of these to us in the motor we described may, indeed, be a cheat, and its father a villain. The devil is not dead. But we claim a pair of good Scotch eyes and are willing to be laughed at. We do not care to find horns in every demonstration of unexpected power. Meantime we commend the inventor for closing his doors until an exhaustive test is made, and until he is quite ready to challenge public inspection. We trust he will succeed.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
March 15, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since March 1, the date of the last tariff order.

Managers are hereby required to enter these changes into their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

66	Athensville, Pa.
*	Barboursville, W. Va.
*	Big Bend Tunnel, W. Va.
*	Brainard, Minn.
122	Bridgeport, Bedford Co, Pa.
146	Beaufort, S. C.
	Colorado City, Col., 1.00 more than Denver, Col.
281	Concord, Mich.
122	Confluence, Pa.
*	Coalsmouth, W. Va.
467	Chetopa, Ks.
298	Dyer, Ind.
397	Drakesville, Iowa.
455	Farragut, Iowa.
446	Forbes, Mo.
288	Furnissville, Ind.
*	Green Pond, Ala.
*	Guyandotte, W. Va.
122	Glencoe, Pa.
482	Highland, Texas.
342	Hickory, Miss, reopened.
141	Indian Creek, Pa.
	Junction Ranch, Montana, tariff same as Pleasant Valley, Idaho.
*	Kennedale, Ala.
122	Meyers' Mills, Pa.
*	New Vienna, O.
13	Norridgewock, Me., reopnd
269	Nunica, Mich.
348	O'Fallon, Ill.
261	Ossian, Ind.
240	Onondaga, Mich.
94	Perrysville, Pa.
122	Pile Falls, Pa.
122	Sand Patch, Pa.
299	Stanton, Ind.
*	Stretcher's Neck, W. Va.
130	Tionesta, Pa, heretofore an other line office.
270	Vandalia, Mich.
*	Vinton, Vinton Co., O.
95	Warrenton, Va.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
	40	3	Cattlesburg, Ky.
Barboursville, W. Va.	85	6	Greenbrier, W. S. Spgs., Va.
	80	3	Cattlesburg, Ky.
Big Bend Tunnel, W. Va.	55	4	Greenbrier, W. S. Spgs., Va.
Brainard, Minn.,	210	14	Milwaukee ck., Chicago.
	55	4	Cattlesburgh, Ky.
Coalsmouth, W. Va.	75	5	Greenbrier, W. S. Spgs., Va.
	30	3	Cattlesburg, Ky.
Guyandotte, W. Va.	85	6	Greenbrier, W. S. Spgs., Va.
Green Pond, Ala.	65	3	Chattanooga, Tenn.
Kennedale, Ala.	90	6	Chattanooga, Tenn.
New Vienna, O.	same as Leesburg, O.		Same as Leesburgh, O.
	80	3	Cattlesburg, Ky.
Stretcher's Neck, W. Va.	55	4	Greenbrier, W. S. Spgs., Va.
Vinton, Vinton Co., O.	same as Hamden, O.		Same as Hamden, O.

OFFICES CLOSED.

Bagdad, Ky.; St. Johns, Ill.; Alma, Ill.

GENERAL INFORMATION.

The "tariff for other lines" from Fishkill, N. Y., to Fishkill Village and Glenham, N. Y., is 30 and 2, and to Matteawan, N. Y., 20 and 2. Messages have been received at Fishkill for these offices upon which only the W. U. rate has been paid. Attention is also called, in this connection, to Rule 3 of the Book of Rules.

Business for Lyons, Iowa, should be sent and checked to Clinton, Iowa.

Business for South Providence, R. I., should be sent and checked to Providence, R. I. Delivery charges, 25c.

Hereafter the "tariff for other lines" from Little Rock, Ark., to Arkadelphia, Ark., will be 75 and 3.

Business for Charleston, Kanawha Co., W. Va., may be sent via Greenbrier, W. S. Springs, Va. "Tariff for other lines," 65 and 4.

Attention is again called to the fact that the printed numbers of the squares for Pleasant Valley, O., and Troy, N. Y., are incorrect. Pleasant Valley, O., is in square 212. Troy, N. Y., is in square 46.

For Perryville, Conn., in last JOURNAL, read Terryville, Conn.

On and after April 1st, 1871, the offices of the Albany and Susquehanna line will be treated as other line offices, and business for them will be sent and checked either to Albany or Binghampton, N. Y.

The following is a list of the offices of the A. and S. line, with "tariff for other lines" from Albany and Binghampton. Business should be sent and checked via whichever gives the better and cheaper route:

	Albany.		*Binghampton.*	
Afton	40	3	30	3
Bainbridge	40	3	30	3
Colliers	40	3	40	3
Cooperstown Jn	40	3	40	3
Cobleskill	35	3	50	3
Central Bridge	35	3	50	3
Duanesburg	30	3	50	3
E. Worcester	35	3	50	3
Esperance	30	3	50	3
Howe's Cave	65	3	50	3
Harpersville	40	3	30	3
Knowersville	30	3	50	3
Maryland	40	3	40	3
New Scotland	30	3	50	3
Oneonta	40	3	40	3
Otego	40	3	35	3
Port Crane	40	3	30	3
Quaker Street	30	3	50	3
Richmondville	35	3	50	3
Seward	40	3	30	3
Schoharie, C. H.	30	3	75	3
Slingerlands	30	3	50	3
Schenevus	40	3	40	3
Sidney	40	3	35	3
Tunnell	40	3	30	3
Unadilla	40	3	35	3
Worcester	40	3	40	3

On and after April 1st, 1871, the offices of the Erie Railway will be CHECKED DIRECT.

The following is a list of the offices and the squares in which they are situated:

83	Addison, N. Y.
101	Adrian, N. Y.
120	Alden, N. Y.
110	Alexander, N. Y.
101	Alfred, N. Y.
120	Allegheny, N. Y.
101	Almond, N. Y.
111	Alton, Pa.
101	Andover, N. Y.
120	Attica, N. Y.
101	Avoca, N. Y.
110	Avon, N. Y.
46	Basket, N. Y.
101	Bath, N. Y.
101	Belvidere, N. Y.
83	Big Flats, N. Y.
66	Binghamton, N. Y.
101	Bloods, N. Y.
111	Bradford, Pa.
101	Burns, N. Y.
120	Buffalo Plains, N. Y.
46	Callicoon, N. Y.
101	Cameron, N. Y.
83	Campbell, N. Y.
46	Campbell Hall, N. Y.
66	Campville, N. Y.
101	Canaseraga, N. Y.
101	Canisteo, N. Y.
120	Carrollton, N. Y.
101	Castile, N. Y.
120	Cattaraugus, N. Y.
46	Cochecton, N. Y.
101	Conesus, N. Y.
83	Corning, N. Y.
120	Cuba, N. Y.
101	Dale, N. Y.
120	Darien, N. Y.
120	Dayton, N. Y.
65	Deposit, N. Y.
83	Elmira, N. Y.
120	Forestville, N. Y.
101	Friendship, N. Y.
101	Gainesville, N. Y.
101	Genesee, N. Y.
41	Godwinville, N. J.
46	Goshen, N. Y.
66	Great Bend, Pa.
120	Great Valley, N. Y.
46	Greenwood, N. Y.
46	Greycourt, N. Y.
41	Hackensack, N. J.
66	Hancock, N. Y.
46	Hankins, N. Y.
120	Hinsdale, N. Y.
41	Hokokus, N. J.
46	Honesdale, Pa.
101	Hornellsville, N. Y.
41	Hudson City, N. J.
101	Hunts, N. Y.
46	Lackawaxen, Pa.
120	Lancaster, N. Y.
101	Liberty, N. Y.
101	Linden, N. Y.
120	Little Valley, N. Y.
101	Livonia, N. Y.
66	Lordville, N. Y.
46	Middaughs, Pa.
46	Middletown, N. Y.
46	Millville, Pa.
46	Monroe, N. Y.
46	Montgomery, N. Y.
46	Narrowsburg, N. Y.
46	Newburgh, N. Y.
46	New Paltz, N. Y.
46	New Windsor, N. Y.
101	Nunda, N. Y.
41	Oak Cliff, N. J.
120	Olean, N. Y.
46	Otisville, N. Y.
66	Owego, N. Y.
83	Painted Post, N. Y.
41	Passaic, N. J.
41	Paterson, N. J.
120	Perrysburgh, N. Y.
101	Phillipsville, N. Y.
41	Piermont, N. Y.
46	Pine Grove, Pike Co., Pa.
46	Pond Eddy, Pa.
101	Portage, N. Y.
46	Port Jervis, N. Y.
46	Ramapo, N. Y.
101	Rathbonville, N. Y.
41	Rutherford Park, N. J.
120	Salamanca, N. Y.
46	Salisbury, N. Y.
101	Savona, N. Y.
101	Scio, N. Y.
46	Shawangunk, N. Y.
46	Shohola, Pa.
83	Smithboro, N. Y.
120	Smiths' Mills, N. Y.
46	Southfields, N. Y.
101	Springwater, N. Y.
65	Stockport, N. Y.
46	Sufferns, N. Y.
66	Susquehanna, Pa.
101	Swainsville, N. Y.
120	Town Line, N. Y.
46	Turners, N. Y.
66	Union, N. Y.
46	Vail's Gate, N. Y.
46	Walden, N. Y.
101	Warsaw, N. Y.
46	Warwick, N. Y.
46	Washingtonville, N. Y.
83	Waverly, N. Y.
101	Wayland, N. Y.
83	Wellsburg, N. Y.
41	Weehawken, N. J.

WILLIAM ORTON, President.

MORSE TESTIMONIAL FUND.

RECEIVED SINCE OUR LAST.

The following receipts should have appeared in our last issue. They leave the balance due about $500, instead of $400, as then stated. We have assurances from several sources of about $300 more, so that but a small balance remains to be secured.

NEW YORK, NEW FOUNDLAND AND LONDON TELEGRAPH CO.

H. H. Ward, sup't Anglo American Tel. Co., N. York	$5 00
Sup't. McKay and operators in Newfoundland	50 29

MISCELLANEOUS.

Ladies of check department, N. York	10 00
William Downey, Ponchatoula, La. [an old boy!]	3 00
Edward Gleason, sup't, Union League, N. Y.	3 00
Tunis J. Powell, Auditor's department, N. Y.	3 00
A Friend, Philadelphia, Pa.	3 00
Profits on 6 Putt's mechanical sounders	4 20
C. M. Frost, manager, Jamestown, N. Y. [2d sub.]	2 00
R. L. Blackman, Jamestown, N. Y.	1 00
L. H. Lathrop, supply dep't., N. Y.	2 00
A. F. Conant, Burlington, Vt.	2 00
H. B. Willett, manager, West Point, N. Y.	2 00
J. E. Manske, manager, Clinton, La.	2 00
W. W. Wall, editor and ex-operator, Clifton, La.	2 00
Martin Barth, Gallatin, Tenn. [2d sub.]	2 00
G. W. Atkins, Gallatin, Tenn.	1 00
James W. English, Burgettstown, Pa.	1 00
Lansingburgh, N. Y.	1 00
Miss Nellie Freeman, Hudson, Mass.	1 00
A. A. Green, agent and operator, Dixon, Mo.	1 00
Thomas H. Phelps, night operator, Dixon, Mo.	1 00
Michael Hays, operator, Great Bend, Pa.	1 00
Miss M. S. Kenney, operator, Andover, Conn.	1 00
S. A. Richmond, Yazoo City, Miss.	1 00
H. J. Taylor, Bath, Illinois	1 00
H. Rogers, operator, Leighton, Iowa	1 00
Kittie B. Cummings, Staatsburgh, N. Y.	1 00
E. A. Beckwith, manager, Chatham 4 Corners, N. Y.	1 00
P. K. Foster, operator, Chatham 4 Corners, N. Y.	1 00
C. E. Allen, messenger, Chatham 4 Corners, N. Y.	50
D. W. Sumption, agt. and operator, Elwood, Ind.	1 00
B. H. Davis, operator, Anderson, Ind.	1 00
James E. King, operator, C. & O. R. R., Greenwood, Va.	1 00
The Baby King, who arrived Feb. 29	26
	$66 96

ATLANTIC AND PACIFIC AND FRANKLIN TELEGRAPH CO.

CITY OF NEW YORK.

We, the undersigned, gladly send our subscriptions for the erection of a statue of Prof. Morse, and trust that the execution of the work may be alike an honor to him and all concerned in its erection:

E. D. L. Sweet, General manager	$5 00
Alfred Nelson, Secretary and treasurer	3 00
J. G. Smith, Superintendent, &c.	6 00
William Roche, private secretary	3 00
E. T. Mackay, Cashier	2 00
M. L. Smith, manager	2 00
W. C. Humstone, Met. sup't	2 00
H. A. J. Dieckman, error clerk	1 00
William McDonnell, supply clerk	1 00
John Carroll, repairer	1 00
J. G. Case, receiving clerk	1 00

OPERATORS.

A. J. Hatch	$1 00	J. F. Olmstead	1 00
R. L. Deakers	1 00	T. G. Kennedy	1 00
John F. Knapp	1 00	F. H. Capron	1 00
E. D. Stevens	1 00	Richard Powers	1 00
Mortimer McCoy	1 00	Petite	1 00
Jesse R. Mills	1 00	Ada M. Gleason	1 00
Robert C. Edwards	1 00	R. S. Keith	1 00
R. D. Williams	1 00	C. M. Cunningham	1 00
E. E. Stuart	1 00	A. R. Reeve	1 00
L. J. Jones	1 00	W. B. Clum	1 00
B. F. Coggar	1 00	Divan and Drogan	50

William A. G. Redfield, clerk	1 00
A. W. Smith, delivery manager	1 00
H. W. Pope, Am. Printing Tel. Co.	1 00
J. E. Fenn, manager, Brooklyn	1 00
H. M. Anderson, foreman repairs	1 00
C. P. Drowne, lineman	1 00
W. C. Burke, Jr., manager, Communipaw	1 00
W. B. Giles, clerk	50
	$56 00

R. R. King, A. & P. Tel. Co., Brewsters, N. Y.	$1 00
J. G. Tobey, manager, Worcester, Mass.	2 00
B. F. Blackall, manager, A. & P. Co., Rochester, N. Y.	3 00
	$6 00

MORE FROM THE SAME SOURCE.

BUFFALO, N. Y., Feb. 2, 1871.

DEAR SIR: Herewith find subscription list from 1st. Division A. & P. Telegraph Co. It would have been larger, but many have given through other channels. All is given cheerfully. I send you the correspondence.

Yours,
C. L. GOODWIN, Sup't.

We give a specimen of the correspondence. All write alike:

DEAR SIR: Enclosed find my dollar. Wish I could make it one hundred. I never gave one more cheerfully. No man reveres the "Father of the telegraph" more than do I.

CLYDE, N. Y. Yours truly, C. C. JENNINGS.

C. L. Goodwin, supt. A. & P. Tel., Buffalo, N. Y.	$5 00
F. T. Bickford, Buffalo, N. Y.	5 00
E. B. Vosburgh, Buffalo, N. Y.	1 00
H. Carmell, Buffalo, N. Y.	1 00
Geo. H. Bowker, Buffalo, N. Y.	2 00
O. H. Lincoln, Buffalo, New York	2 00
C. F. Towers, Buffalo, N. Y.	1 00
D. W. C. Hoover, Tonawanda, N. Y.	1 00
Ge. W. Hurd, Niagara Falls, N. Y.	1 00
Geo. J. Davison, Suspension Bridge, N. Y.	1 00
L. J. McPartlin, Jr., Lockport, N. Y.	1 00
F. R. Downs, Medina, N. Y.	1 00
A. W. Barnett, Albion, N. Y.	1 00
Miss C. A. Hall, Fairport, N. Y.	1 00
C. C. Jennings, Clyde, N. Y.	1 00
W. H. Thomas, Wolcott, N. Y.	1 00
Wm. N. St. John, Red Creek, N. Y.	1 00
W. R. Selleck, Seneca Falls, N. Y.	1 00
A. G. Fox, Auburn, N. Y.	1 00
Horace G. Osborne, Skaneateles, N. Y.	1 00
C. H. DeCoudres, Marcellus, N. Y.	1 00
T. M. Petty, Oswego, N. Y.	2 00
L. C. Pierce, Oswego, N. Y.	1 00
Charles R. Smith, Fulton, N. Y.	2 00
E. M. Harris, Syracuse, N. Y.	2 00
Chas. W. Brewster, Syracuse, N. Y.	1 00
Charles Bagley, Syracuse, N. Y.	1 00
Calvin C. Stanley, Syracuse, N. Y.	1 00
Edward Wilson, Syracuse, N. Y.	1 00
Seth D. Baldwin, Oneida, N. Y.	1 00
Ed. E. Hungerford, Rome, N. Y.	1 00
J. D. Wal Congdon, Utica, N. Y.	1 00
G. L. Fay, Utica, N. Y.	1 00
G. A. Trowbridge, Ilion, N. Y.	1 00
W. P. Munson, Herkimer, N. Y.	1 00
Miss Tillie Brown, Little Falls, N. Y.	1 00
A. E. Cox, St. Johnsville, N. Y.	1 00
Marius Powell, Fort Plain, N. Y.	1 00
M. E. Cox, Canojoharie, N. Y.	1 00
Silas W. Horning, Fultonville, N. Y.	1 00
Casimar Beehler, Amsterdam, N. Y.	1 00
R. H. Zubler, Schenectady, N. Y.	1 00
Mrs. Frank Whipple, Albany, N. Y.	1 00
W. H. Gay, Albany, N. Y.	1 00
A. L. Whipple, Albany, N. Y.	1 00
C. Aspinwall, Troy, N. Y.	1 00
S. F. Day, Ballston Spa, N. Y.	2 00
E. B. Van Keuren, Rhinebeck, N. Y.	1 00
	$60 00

Well done A. & P. Glad the bars are all down now.

FROM NEVADA.

RENO, Nevada, Feb. 22, 1871.

DEAR SIR:—Enclosed please find coin draft for $67, a small donation from the boys of the Silver Land. With best wishes for the success of the undertaking.

Yours truly, FRANK BELL.

Frank Bell, Dist. Supt. W. U. Tel. Co.	$5 00
John C. Clowes, manager, Reno	2 50
John R. Yontz, operator, Reno	1 00
Jos. L. Sears, operator, Reno	1 00
A. M. Ardery, operator, Reno	1 00
Emmet Jones, messenger, Reno	50
Geo. Senf, manager, Virginia	5 00
H. A. Hedges, receiver, Virginia	2 50
Dick Lewis, operator, Virginia	1 00
J. P. Callaghan, operator, Virginia	1 00
H. Kesten, repairer, Virginia	1 00
G. A. Morgan, messenger	50
J. W. Cummings, messenger	50
T. B. Shamp, manager, Franktown	1 00
F. G. Wyatt, manager, Dayton	2 50
S. W. Chubbuck, manager, Gold Hill	2 50
C. V. Boisot, manager, Silver City	5 00
N. J. Saviers, manager, Carson	5 00
J. C. McFernahan, messenger, Carson	50
J. B. Carter, operator, Emigrant Gap	1 00
P. H. Lovell, district superintendent, W. U. Tel	2 50
W. J. Hamilton, manager, Elko	2 50
A. J. Ellis, messenger, Elko	1 00
A. R. Schively, manager, Truckee	2 00
Jacob Kuenzly, operator, Alta	2 50
S. M. Willis, operator, Auburn	1 00
Ed. Fowler, operator, Wadsworth	1 00
Ned Reese, operator, V. & T. R. R., Gold Hill	1 00
C. T. Bender, manager, A. & P. Tel., Virginia	2 00
J. L. Foster, messenger, A. & P. Tel., Virginia	50
A. B. McCoy, operator, C. P. R. R., Reno	1 00
Joe. Stewart, operator, C. P. R. R., Rocklin	2 50
J. C. Young, operator, C. P. R. R., Alta	1 00
D. W. Kauppikus, operator, C. P. R. R., Blue Canon	1 00
E. B. Pixley, operator, C. P. R. R., Elko	1 00
A. L. Bousher, repairer, C. P. R. R., Carlin	1 00
Pat. Henry, operator, C. P. R. R., Truckee	1 00
C. E. Crall, operator, C. P. R. R., Truckee	1 00
Dan Shay, repairer, C. P. R. R., Truckee	1 00
L. R. Schiveley, messenger, C. P. R. R., Truckee	50
John F. Allen, Reno, Nev., for cost of draft	1 50
	$68 50
Cost of draft	1 50
	$67 00
Gold premium	7 28
	$74 28

Do these, our little dollars, count?
We'd not be late for twice the amount!

W. E. Beals, manager, Stryker, O.	$1 00
J. W. Jones, operator, Stryker, O.	1 00
	$2 00

LEHIGH COAL AND NAVIGATION CO. TELEGRAPH.

L. A. Ludwig, manager, Whitehaven, Pa.	$1 00
Thomas J. Hogan, night operator, Whitehaven, Pa.	1 00
Harry W. Reitzel, operator, Leslie's Run	1 00
Thomas N. Paterson, sup't., Germ. Penn. Coal Co., Treskow	1 00
Henry E. Lubken, operator, Treskow	1 00
John Turnbach, operator, Drifton, Pa.	1 00
Charles H. Weiss, operator, Eckley, Pa.	1 00
James Williamson, operator, Eckley, Pa.	1 00
	$8 00

A letter carefully written, evidently by some lady rogue, encloses us 15 cents, to be credited to No. 1, 2, and 3 clerks in the N. Y. Delivery Department.

The following is another evidence of the growing generosity which pervades the offices of the telegraph in America:

BUFFALO, March 8, 1871.

J. D. REID, Esq.:

Dear Sir: I hand you herewith draft on Messrs. White, Morris & Co., 29 Wall street, for $30 25, contributed by the employees of the Buffalo W. U. Office, to be expended by you, for the benefit of the widow of the late George Clark.

Please acknowledge receipt,

Yours truly, N. HUCKER.

We may add that about $200 were subscribed in New York to disinter the remains of Mr. Clark at West Point, Ga., and bring them to Brooklyn, N. Y., for burial. All these acts speak loudly for the American craft.

◆

Mr. Walter P. Philips, an old telegrapher, now editor of the Providence *Herald*, writes of the late Dr. Cure as follows:

Dr. Josiah A. Cure, entered the business in 1846, almost as soon as telegraphs began to be made practicable in this country, learning the Morse system and contending it to be the *only* one worth mentioning, ever put in use. Although never aspiring to a higher position than that of an operator, and notwithstanding he passed twenty-four years "at the key," he adhered to first principles and always read the characters upon the ribbon paper instead of by "sound," as is done by all modern operators. Indeed, the venerable doctor always viewed the science of "sound" reading with rather a distrustful eye, and was wont to look upon modern experts in a way which implied that in his opinion their existence was only of short duration, and that the good old times would come again when the rate of transmission would be moderated about one-half, and when the superannuated "registers," rusty from long disuse, laid away in out of the way places, would again be set in motion. Alas! for the poor Doctor; "registers" to emboss ribbon paper have floated down the stream and far out into the sea, and the merry clicking "sounder" has superceded it forever! He, too, has gone out with the tide.

◆

A SIGNAL light, to be attached to the rear of trains, invented by two officers of the Little Miami Railroad, has lately been tested on that road. It is thus described:

"In the centre of the roof of the rear car of the train, over the rear axle, is placed a square lantern, with alternate pains of red and white glass. The lantern is connected by means of a shaft with one of the axles in such a manner that eight revolutions of the axle produce one of the lantern. When the car stops, the lantern of course ceases to revolve. Upon each side of this main lantern are two others, also connected with the axle in such a way that when the train is moving forward a solid red light is displayed, and if backing, a solid green light. The engineer of a train coming up in the rear can thus tell, by observing these lights, whether the train before him is moving or at a standstill, and if moving, in which direction.—*Railway Gazette.*

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

RECEIPTS SINCE LAST NUMBER.

ASSESSMENT NO. 18.

107 169 230 235 262 263 264 265 266 287 333
350 396 418 450 634 636 652 669 674 698 818
859 906 922 968

ASSESSMENT No. 19.

43 76 89 107 117 118 169 188 211 227 230
235 259 287 333 350 381 383 396 422 429 431
440 443 450 452 563 575 590 618 628 636 649
652 654 666 706 715 721 722 734 737 770 812
848 850 883 906 922 932 941 953 968 1018 1026
1052 1053 1056 1066

ASSESSMENT No. 20.

3 4 6 8 17 23 25 26 30 33 40
41 42 43 46 49 51 53 54 55 58 59
65 67 71 72 73 74 75 76 77 78 80
82 86 91 93 94 96 97 100 104 106 107
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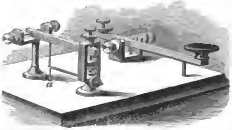

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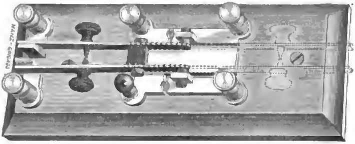

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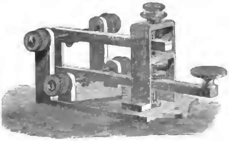

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II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and th payment of dues.

XI. A meeting for the election of officers shall be held annually during th first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written reques of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer.

GERRITT SMITH, Secretary.
A. S. BROWN,
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JOURNAL OF THE TELEGRAPH.

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THE LAW OF TELEGRAPHIC MISTAKES.

It is remarkable that mistakes in the transmission of telegrams are not more frequent and serious than they are, and the fact bears strong testimony to the care and efficiency with which our telegraphic lines are generally managed. When errors occur, however, they not unfrequently result in litigation, and the legal decisions to which they give rise are of great interest, on account of the widely extended and rapidly increasing use of the telegraph. A recent case in England, where the law of railways and telegraphs has kept pace with the same branch of law in this country, bears directly on some important questions.

The plaintiffs were gun-makers in London. The defendant was a gun-maker at Newcastle-upon-Tyne, and in June last he wrote the plaintiffs as follows: "Send sample Snider, with sword-bayonet; forward immediately. I can fix an order for fifty, I think, and it may lead to many large orders. Can you do them at 34s. net cash on delivery, so as to secure the order? I shall have to cut very fine, and several will be in for it." The plaintiffs sent them a sample rifle with this note: "We have forwarded you this day, sample Snider, with sword-bayonet. We cannot possibly do them for less than 35s. net cash." Soon after, the following telegram, which purported to come from the defendant, was received by the plaintiffs: "Send by mail immediately *the* Snider rifles, same as pattern. Must be here in the morning. Ship sails then." They thereupon sent fifty rifles to the defendant, who, two days afterward, wrote them, expressing his surprise at the receipt of *fifty* rifles when he had telegraphed for but *three*. It proved that the clerk at the telegraph office had by mistake transmitted the word *the* instead of *three*, which the defendant had written on the message paper.

When suit was brought in the Court of Exchequer by the plaintiffs for the price of the fifty rifles, the defendant consented to pay for the three rifles which he had actually ordered, bnt the plaintiffs moved that a verdict might be entered in their favor for the remaining forty-seven rifles.

Upon the argument of this motion it was contended in behalf of the plaintiffs that the telegraph clerk was the agent of the defendant to transmit the message, who was therefore responsible for his agent's mistake. But the answer to this was, that although the managers of the telegraph are agents for the transmission of messages, they are agents to transmit them only in the terms in which the senders deliver them, and their authority extends no further. The Court held this to be the law, and the opinion was delivered by Chief Baron Kelly, who said that in consequence of the mistake, for which the defendant was not responsible, there was no contract between the parties, and consequently the plaintiffs were not entitled to recover for the forty-seven Sniders sent in addition to those really ordered.

The question, why not sue the telegraph company, since the error was theirs? at once suggests itself; and in this country, where corporations own and control the telegraph lines, the suggestion would be practicable. But in England last year the Government assumed the management of the telegraph, and all the lines were transferred to the Post Office Department; and according to the English law, the plaintiffs could not proceed against the Post Office; so that the decision, although legally correct, worked a certain hardship against them in that they suffered the consequences of a mistake which occurred through no fault of theirs, yet for which they could not make any one pecuniarily responsible.—*N. Y. Sun.*

◆

ELECTRO DYNAMICS.

To the Editor of the Journal of the Telegraph:

SIR: I have to thank you for forwarding me your Journal of February 15.

In that Journal I find that a writer subscribing himself "Dynamics," has very ably, truly, and successfully, vindicated my theory. But he has fallen into one mistake. He says that a battery is exerting its maximum force, or producing the greatest intensity of current, when the external resistance is equal to the internal. There is a great confusion of ideas about this point, which I shall be glad to clear up, as I have already done in the *Chemical News.*

If we have a given external resistance, and also a given nnmber of cells or a given area of say zinc and platinum, the greatest intensity is produced when the cells are so arranged, or the area of zinc and platinum divided into so many parts, that the external resistance is equal to the internal. Also we get, in this way, the maximum heat in the external circuit, but not in the *whole* circuit. The greatest heat in the whole circuit is when the battery is arranged as one large cell. But if we have another and different problem, namely, a given battery arranged in a given manner, and we want to find how to arrange the external circuit so as to get the greatest intensity and greatest heat in the whole circuit, we must make the wire as short and thick as possible. If we want to get the greatest heat in the external circuit, we must make the external circuit equal to the internal. If we want to get the greatest magnetic power, we must make the wire as long and thick as possible.

I will not tronble you with the mathematics of these solutions, but any mathematical electrician can verify them for himself.

I remain yours, obliged,

H. HIGHTON.

2 The Cedars, Putney, London S. W., England.

◆

THE ELECTRIC SPARK.—Faraday was the first to elicit the electric spark from the magnet. He found that it is visible at the instants of breaking and of renewing the contact of the conducting wires, and only then.

"Around the magnet, Faraday
Is sure that Volta's lightnings play:
But *how* to draw them from the wire?
He took a lesson from the heart:
'Tis when we meet, 'tis when we part,
Breaks forth the electric fire."

JACOBI'S THEORY OF ELECTRO-MOTORS.

BY THE REV. H. HIGHTON, M. A.,

Late Principal of Cheltenham College, and Fellow of Queen's College, Oxford.

M. Jacobi, as is well known, was supplied with funds by the Emperor Nicholas of Russia, to construct an electro-dynamic engine, which he did, and applied it to work a vessel on the Neva. His engine was a failure in point both of economy and power; and he wrote to show that this arose from the necessity of natural laws, and, consequently that no one else could succeed.

His mathematical investigation of the subject led him to the conclusion that the power evolved by a battery was as the heat and as the expenditure of zinc. This chimed in exactly with the fashionable theory of the age, nearly put a stop to experiments on the subject by really scientific men, and left it to mere empirics. In fact, a successful electro-dynamic engine has been relegated almost to the category of perpetual motion and the philosopher's stone.

I hope to be able to show that Jacobi's conclusions are neither more nor less than a *reductio ad absurdum* of the doctrine of a mechanical equivalent of heat and chemical change.

He shows clearly enough that when a magnet does work it diminishes the intensity of the currents and the consumption of zinc. This he attributes to the production of counter-currents, and investigates mathematically the supposed laws of these counter-currents; and from his premises he works out, in a mathematical shape, all the formulæ connected with the subject, the mathematical expressions for the maximum of work done, for the expense, for the connection between the work and heat, for the most efficient arrangement of the battery, &c. Grant the premises, and his conclusions follow. But it is also quite as clear that, if his conclusions are absurd, his premises, and everything drawn from them by mathematical reasoning must be false.

I set out, then, by asserting that his conclusions are absurd. For what is his main conclusion, on which all else is made to depend? It is his formula for the maximum work of an electro-dynamic engine.

This is—

$$T_{\circ}=\frac{n_{1}k_{1}}{4\rho\kappa}$$

in which $T_{\circ}$ = maximum of work; *n*, number of cells in battery; *k*, electro-motive force of the elements used; *ρ*, the total resistance of the circuit; *k*, a coefficient depending on the inertia of the iron used in the magnets. Now, I say that this great leading formula, on which all his other deductions are based, is utterly absurd, and, therefore, by the *reductio ad absurdum*, disproves his premises and all the conclusions based upon them. For, it will be observed, that, other things being equal, the maximum work varies inversely as the total resistance of the circuit.

Now, since the total resistance of the circuit is least when the coils of wire are shortest and thickest, it follows that the shorter and thicker the wires of the coils the more work the engine does, and that it does most work when there are no coils at all! If this is not a *reductio ad absurdum* I do not know what can be. M. Jacobi seems half conscious of this, for he draws attention to it and comments on it; but the absurdity and impossibility of it seems never to have struck him. Well may M. de la Rive call this a remarkable conclusion, that (as he expresses it) the maximum work of an engine should be entirely independent of the number and size of coils; but the absurdity of it seems never to have struck him either. The fact is that the mathematical expression of physical phenomena, unless checked by the utmost care about the premises, is like a powerful but self-willed steed which takes the bit into its mouth and rushes with its rider into a slough of absurdity.

I am not bound to show where the error or errors in the premises lie, but I will point out several possible sources of these errors. (1.) He assumes the power of a magnet to be represented by $l^2 \times i^2$, l being length of wire in coils, and i the intensity of current. This, in actual practice, is seldom, if ever, true. (2.) He assumes, without proof, that the diminution of the intensity is due simply to counter currents. (3.) He assumes that the intensity of these counter currents is expressed by—

$$\frac{\kappa m \beta v}{\rho}$$

where κ is a co-efficient depending on the inertia of the magnets, m the magnetic power, β the length of the wire of the bobbins, v the velocity of motion, ρ the total resistance of circuit. (4.) The nearness to which the magnets approach each other in their motion never enters into any of his formulæ, so that the power would appear to be the same if they never approached nearer than an infinite distance. But, above all, he never checked his mathematical conclusions by his practical experiments to see if they agreed. He expressly tells us he did not do so.

He admits that when M. Botto, of Turin, assisted by a committee of *savans*, tested the matter practically, they found that the force did not vary as the consumption of zinc or as the heat, but he sets aside these conclusions by remarking that M. Botto measured the work performed by the number of foot-pounds raised; but that he ought to have taken, as his measure, the number of foot-pounds multiplied by the velocity with which they were raised, which, I need not say, is a wholly erroneous view. A foot-pound raised from a state of rest to a state of rest, is a measure of the same total amount of power, with whatever velocity it be raised. The only difference is that in one case a higher force is exerted for a shorter time.

Let me draw the conclusion, then, that having cleared the way by showing the falsity of our ordinarily accepted theories, it remains for us to do what has never yet been done, namely, to establish by a very large number of properly devised experiments, carried out by scientific men combining for that purpose, the true and full laws which regulate the connection between chemical change in a galvanic battery and magnetic power; and by constructing, as has never yet been done, an electro-dynamic engine, built on really sound principles, to ascertain whether electro-dynamic power can be used conveniently and economically. It is asserted, on apparently good authority, that the practical problem has been most satisfactorily solved in America. Once clear away the fallacious theories now prevailing, and time will soon bring us to sound practical results.

PUTNEY, February 15, 1871.

[*From the Scientific American.*]

ON THE PROPER RESISTANCE OF TELEGRAPHIC RELAYS.

There is not, as a general thing, any well-defined idea, among telegraph men, of the amount of resistance which develops the greatest attractive force, or magnetic effect, in a relay. If there be no resistance, there is no effect, and, on the other hand, when the resistance is infinite, the effect is also nothing. The practical question, therefore, is to determine the amount of resistance that produces the maximum effect.

In order to make this point clear, it is necessary to state that every turn or convolution of a conducting wire around the core of an electro-magnet, produces in the latter a certain magnetic effect. Two turns produce twice the effect of one turn, but the length, and consequently the resistance, of the wire is also doubled.

Now, as the magnetic effect is always inversely in proportion to the resistance of the circuit, this effect would remain unaltered—that is, it would be the same with two turns as with one turn, were there no other resistances in the circuit. But there are other resistances in the circuit; namely, that of the battery, and the connecting wires, and the sum of all the resistances must be doubled, in order to halve the attractive force of the magnet. Therefore, by multiplying the turns of wire in the helices, the magnetic force is augmented.

If we wind one layer of convolutions of silk-covered wire in a helix of given size, we get a given number of turns, and it is evident that, with a smaller-sized wire, we can get a greater number of turns, but, on the other hand, the smaller wire has a greater resistance, and this again diminishes the magnetic effect.

To illustrate this: I have taken a spool of the dimensions of an ordinary telegraphic relay. The spool is two inches in length, and the inside diameter one-half inch. It is wound with silk-covered wire to the depth of one-half inch. The spool then has a diameter of one and a half inches, by two inches in length, outside measurement. Of course one-half inch of the diameter is the iron core in the centre.

The spool was first wound with No. 20 wire (Birmingham guage), the turns or convolutions carefully counted, and the resistance measured. Both the resistance and the number of convolutions in a relay will be double that of a single spool. Therefore, by winding this spool successively with the different sizes of wire, from No. 20 up to No. 35, (Birmingham guage), counting the number of convolutions, and measuring the resistance in Siemens' units, we have the following table of results:

Relays. Size of wire.	Number of convolutions.	Resistance Siemens' units.	Relays. Size of wire.	Number of convolutions.	Resistance Siemens' units.
No. 20	1,616	4·3	No. 28	6,536	87·0
" 21	1,904	5·22	" 29	8,016	135·5
" 22	2,256	8·32	" 30	9,496	184·2
" 23	2,816	16·6	" 31	10,784	280·1
" 24	3,375	25·6	" 32	12,080	376·0
" 25	4,136	39·8	" 33	12,568	416·0
" 26	5,066	46·2	" 34	13,064	504·0
" 27	5,862	67·4	" 35	13,600	560·0

This table may be considered a fair approximation to the actual value of the resistance and magnetic effect produced in relays wound with silk-covered copper wire, from No. 20 to No. 35, (Birmingham guage). In practice, we are required to select from these relays the one best adapted to the conditions of a given circuit, that is, the one which has the greatest attractive force. The latter is in direct proportion to the number of convolutions in its helices, and inversely in proportion to the total resistance in the circuit.

Suppose, for example, we have a wire 100 miles in length, of the usual average resistance, say 20 units per mile, and we wish to use one relay at each terminal without intermediates. Say there are 50 cells of battery giving 2 units resistance per cell. We can find, by trial and calculation, which relay will give the best result, and is, therefore, best adapted to the circuit.

	Units.
The line resistance is	2,000
The battery resistance is	100
For trial, we select the relay wound with No. 30 wire.	
The two relays will give twice 184·2—	368
Total	2,468

These relays have 9,496 turns of wire each, which, divided by the total resistance in the circuit, gives a quotient of 3·84, and this represents the effective strength of the magnet wound with No. 30 wire.

We will now substitute the magnets wound with No. 35 wire, and observe the comparative effect:

	Units.
Resistance of line and battery, as before	2,100
Resistance of 2 magnets, as per table	1,120
Total resistance in circuit	3,220

Dividing the number of convolutions by the above resistance, we have $\frac{13,600}{3,220} = 4·22$.

We find therefore that, for a line of No. 9 iron wire, 100 miles in length, relays wound with No. 35 wire produce a much greater effect than relays wound with a coarser wire, and are better adapted to that circuit, when only two relays are used, one at each terminal. By the same process we find that the relays become less and less adapted to the circuit, as the size of the wire in the helices is increased.

For another example, we will take a wire with many intermediate stations. Say the length of the line is 100 miles, and the number of relays in circuit, twenty.

Calling the resistance of the line and battery 2,100 units, as before, add, to this resistance, 20 times that of any one of the relays in the above table, and dividing the number of convolutions by the total resistance, we find, by trying each magnet separately, that No. 28 wire, with 87 units resistance, gives the highest quotient, and is consequently the relay best adapted to that circuit.

Commencing with the No. 20 wire and going through the list, we have for quotients, or magnetic effects, the following:

No. 20	0·74	No. 28	1·70
" 21	0·85	" 29	1·67
" 22	1·00	" 30	1·64
" 23	1·15	" 31	1·40
" 24	1·29	" 32	1·24
" 25	1·42	" 33	1·15
" 26	1·68	" 34	1·07
" 27	1·69	" 35	1·00

We will now take the case of a short local telegraph of two miles of wire and four relays used as sounders, in which it is required to find what resistance in the sounders will produce the best results. Say the battery has ten cells of 2 units resistance each, and two miles of wire, at 20 units per mile. The total resistance of the battery and line will be 60 units. By trial, it will be found that the No. 22 wire sounder, having a resistance of 8·32 units, is the best instrument for such a circuit.

This investigation of the effect of winding a spool, or constructing a helix with different sizes of silk-covered copper wire, was carried no further than to No. 35. It is evident that if the spool had been lengthened one inch, we would have obtained 50 per cent more convolutions, and increased the resistance in the same ratio, giving us 20,400 convolutions and 840 units resistance for the relay.

On a line of 300 miles, with a relay at each terminal, the gain in magnetic effect, with this relay of 840 units resistance, is about 50 per cent. over the one wound with No. 32 wire, having a resistance of 376 units. On a line of 500 miles the gain is about 55 per cent., and on 1,000 miles 72 per cent., showing that the greater the resistance of the circuit, the greater the number of convolutions required in the relays, the resistance of which will necessarily be in exact proportion to this number.

Ruhmkorff's astatic galvanometer, an instrument made to detect currents in a circuit of great resistance, has itself a resistance of 7,000 units, and 40,000 convolutions of very fine wire.

We can see from what has been shown above, how unsulted an ordinary relay is for a local sounder. We could probably get about 1,000 turns of No. 18 wire on these spools, and the resistance would not be over one unit. With one Grove cell for battery, we would have but two units resistance in circuit. Dividing the number of convolutions by the resistance, we get a quotient or magnetic effect of 500. If we wind the same spools with No. 32 wire, and divide the number of convolutions, 12,080, by the resistance, 377 units, the quotient is 32, or less than one fifteenth the effect produced by the coarse wire.

By the aid of the above table of convolutions and resistances, and a Siemens' galvanometer, any one can determine, with a sufficient approximation to accuracy, the resistance of the relays best suited to the circuit, and work up his own particular case.

Rule.—Select from the column of resistances that of any particular magnet. Multiply this resistance by the number of magnets in the circuit. To this product, add the resistance of the line and battery. Divide the number of convolutions, in the relay selected, by this sum. By this method, ascertain the relay giving the greatest quotient, which is the one best adapted to the circuit. B.

◆

ELECTROMETERS.

Sir William Thomson has brought out an electrometer which has now assumed a very complete form. His divided-ring electrometer admitted of accurate measurements in skilled hands, of fractions of a Daniell's cell; his portable electrometer admits of readings from 10 or 20 cells upwards; but his new reflecting electrometer gives as much as 100 divisions on the scale for one single cell of the battery. In the Universal Exhibition of 1861, Mr. Varley exhibited an electrometer of an entirely novel construction. It had six plates rotating inside hollow cheeks arranged with platinum connections. The first plate multiplies the source of electricity a definite number of times; this increased charge is used to excite a second one, this a third, and so on up to the sixth plate. When a single cell of Daniell's battery was applied at one end of this machine, it produced sparks of the same electricity, ⅛in. in length, and therefore a multiplying power of about 15,000 times was obtained. This instrument is of all the most delicate yet constructed. When a single element of Zamboni's pile is used to excite it, the sixth plate has power enough to diverge a gold-leaf electroscope, and make it strike the sides. Even a thermo-electric pile whose power is not more than the six-hundredth part of a cell is quite sufficient to give powerful indications at the distant end.

In Mr. Varley's patent of 1860, he describes a method which he employed to make the one plate charge itself, and on this principle he constructed a large electrical machine, which he exhibited at a soiree of the Royal Society in 1869–70. This machine has been adopted by Sir William Thomson for maintaining the charge in his electrometer. This new electrometer is really a combination of three inventions—of Sir William Thomson's portable electrometer to indicate whether or no the instrument is sufficiently charged, of the replenisher by Mr. Varley for charging or discharging, and of the quadrant electrometer for reading off the minute tensions measured. This instrument is, in its present form, so practically useful that it has been largely used in connection with telegraphic cables, and Mr. Varley has recently calculated tables to enable any electrician at a glance to infer from two readings by this electrometer the insulating power of any telegraphic cable.

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In the chief operating room of the Western Union Telegraph Co., New York, and performing part of its regular routine service, is an operator only fourteen years of age. He was educated by Mr. Westbrook, of Wilmington, Del., when only 11 years of age, and at that age was placed in service at Cape May. From thence he took charge of the office at Princeton, N. J., and during the strike went to Washington, D. C., performing there the full service of a veteran operator. This boy, whose name is Benjamin Johnson, is an easy and rapid penman, can transmit easily 2,000 words an hour, has the manners of riper years, and has a pleasant courteousness which is indicative of self-respect and companionliness.

◆

Mount Washington, Hamilton Co., Ohio.

To the Editor of the Journal of the Telegraph.

I presume you do not understand my invention, hence I write to correct your mistaken fears in regard to the matter.

First.—It does not require two wires; only one is needed. If it did, I think it would still be advantageous, because one man would transmit as much on two wires in a given time as three men on three wires, which certainly would be an advantage.

You doubt the ability to manipulate two keys, so as to write 120 words per minute.

My answer is, that a lady at her piano will strike six keys as readily as one key. Why not manage two keys as readily in telegraphing?

If the word *paid* can be written forty times in a minute on one key (and I suppose it can), the operator makes 480 beats to accomplish it. The same word requires only 480 beats to make it 120 times on my instrument. The word contains four letters. The entire alphabet, including the "&," is made with one beat to each letter on the two keys, while on one key 82 beats are required; hence forty words, containing four letters to the word, would require 160 beats; and if 480 beats can be made in one minute, he would write 120 words in that time; and if the ear can recognize the 480 beats or sounds on the one, it can on the other. However, my invention is new, no operators have had time to acquire much skill, yet seventy words per minute has been written, and I have no doubt whatever but what an expert will be able to write over 120 words per minute; and if it could not be taken by the ear, it could be read from the Register.

Respectfully, H. C. Nicholson.

Note.—Two notes on a piano produces harmony, and simply delights the ear. To detect by the ear whether a stroke is made by one or two electric hammers is a very different thing, and not likely to be attempted. Does Mr. Nicholson believe that if a piano were pitched to a single note for every key, he could tell by the ear when three, or two, or one of these were struck? And, if that were possible, does he believe such sounds could be read by the ear at the rate he indicates? However, as Mr. N. has not described his process, it is presumptuous in us to criticise what we have not seen.

THE TELEGRAPH DESPATCH TUBE.

The necessity of sending telegraphic despatches from one part of a town to another without the loss of time occasioned by going through the busy parts on foot has induced the Post Office authorities to sanction the laying down of an experimental tube in the busiest parts of the city of London. The tube is 3in. in diameter, and is in direct communication with the Fleet Street branch from the main office. The messages, as they arrive by the wires from the Provinces or the Continent, are deciphered in the usual manner by clerks, and those intended to be delivered, say a mile from the receiving office, are then enclosed in a light cylinder. This cylinder is covered with felt, and when filled, it is inserted in the tube, and the flap or cover closed, when a strong current of air being blown into the tube and behind the cylinder, forces it through to the branch office. In a recent experiment, the carrier occupied about four minutes of time to travel the distance, 2,058 yards. Shunts are provided, so that the carrier can be sent in any direction, the intermediate flaps or points being closed to allow it to pass, the shutting and opening of the points being first communicated by wire. The carriers are capable of being drawn or sent back either by suction or by a blast at the opposite end.

The invention is considered of great value by the authorities, as it will expedite the delivery of the messages. In fact, something of the kind was needed, from the continually increasing use made of the telegraph by the public since it has been in the hands of the Post Office Department. We understand that Mr. Siemens, the inventor, has been authorized to extend the tube to the station at Charing Cross, with branches leading to the post offices *en route*, so that if the working is found successful, of which we have little doubt, we shall have a complete system of tubes all over London in a very short space of time.

The plan will, in course of time, be employed for sending letters to various branches, after they have been sorted at the head office, and this will enable them to be delivered in about half an hour after being posted.—*Mechanics' Magazine.*

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The Effect of Electricity upon Blood.—Professor Newman, of Konigsberg, in studying the action of electricity upon the animal organism, has recently found that under the influence of powerfully induced currents the white blood corpuscles of the frog swell up. Between their walls, which become very smooth, and the interior granular nucleus a free space is left, and the granules of the nucleus manifest rapid movements.

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Z. T. Gramme and E. L. C. D'Ivernois, Paris. Magneto-Electric Machines. Dated June 9, 1870.—This consists in giving to the soft iron or other suitable magnetic material which is to become magnetised by the influence of one or more either permanent or electro-magnets the form of a solid or hollow ring, cylinder, or other suitable endless shape, constructed either out of one piece of iron or of a bundle of iron wires, and round the entire surface of which endless core is laid a series of coils of suitable isolated wire of copper or other good conductor of electricity in such manner that the said coils or helixes of wire, together with the endless core on which they are laid, may be considered as forming one continuous series of small bobbins, the wire of each two succeeding ones of which small bobbins being soldered or otherwise metallically connected together end to end, so as to constitute one large endless bobbin, in which when the said bobbin is caused to revolve with a regular continuous motion, continuous induction currents will be developed by the magnetic radiation of the poles of one or more either permanent or electro-magnets to the influence of which the said endless bobbin is submitted, the continuity of the revolution of the bobbin procuring in this latter a continuous displacement or advancing of the magnetism—Patent completed.

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The Electric Light in Warfare.—An experiment has been made at St. Petersburg with the view of ascertaining whether the electric light is capable of being turned to account in night warfare. The trial proved completely successful. With an ordinary piece of field artillery, the experimentors succeeded in lodging every ball in a target, at a distance of 1,000 yards. Not merely the target, but also surrounding objects to a considerable distance were rendered perfectly distinct in spite of the darkness of the night.

CONDUCTING WIRES FOR MILITARY TELEGRAPHS.

The conducting wires of the military telegraphs used in the French army are so made as to be capable of resisting the trampling of horses and the crushing of wheels of the heaviest vehicles on common roads, but not that of artillery. Of late the French military authorities have paid great attention to military telegraphy, and before the war broke out they instituted a series of experiments on it at the camp at Chalons. Lines of wire, says *Van Nostrand's Magazine*, were laid down in every direction on the public roads, and allowed to remain there day and night for whole weeks at a time, subject to all the passing traffic of horses and vehicles of every description, and to every change of weather; and it was found that, notwithstanding all these trials, messages could be transmitted with perfect accuracy and facility. The wire with which the experiments were tried, and which is used at this moment by the French, is simply a line about one-fifth of an inch in thickness. It is a sort of a miniature submarine cable, which, being protected by a strong covering, is capable of resisting the dangers of rupture and crushing, and, to the eye of the uninitiated, presents the appearance of a thin tarred rope. In the centre of it four threads of copper, twisted together, form the metallic portion which is to conduct the electric fluid, or rather the electric motion. A final spiral of cotton surrounds them; over this is a thin coating of india rubber, and the whole, wrapped in a species of vegetable hair, is fastened together and held by two ribbons of impermeable stuff. The cable is wound round enormous bobbins, arranged in military line, 8 and 8, on special vehicles, and is wound off as the army advances. When it is to be used one of the telegraphers fixes it on the ground by double nails, resembling hair pins. But each carriage contains only 1,100 or 1,200 yards of cable, and it frequently happens that the message has to be sent to a greater distance. In this case it becomes necessary to unite the cable already laid with that contained in another carriage. The telegrapher, therefore, cuts the ends of each wire, lays bare the copper thread, untwists them in a delicate manner, and then plaits the strands of each cable together, or, as sailors would say, splices them; and this operation can be repeated as often as need be. As, in the French service, the rule is to send a train of eight carriages laden with cable, with each brigade or division of the army, it is eviden tthat telegraphic communication can be carried on to no greater distance than about 10,000 yards, or not quite 6 miles In a great battle, extending over several miles, and in operations such as the recent campaigns, extending over a large area—say forty or fifty miles—these field telegraphs would have to be very numerous in order to keep up communication with all points of the line.—*Scientific American.*

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We are indebted to Mr. J. Whyte, of the Capital Office of the A. & P. Tel. Co., Albany, N. Y., for Legislative papers, and to the Postmaster of the Assembly for valuable documents.

HASKINS' REPEATER.

The cut shows a section of the two relays forming the Repeater, also the two sounders, and local batteries.

The repeating is done entirely by the relays

The main circuit of No. 1, after passing through Relay No. 1, passes over to the points of Relay No. 2, connecting across from the top of the armature through spring I 2, to the top of the yoke E 2, and then back to its own side. Main Circuit No. 2 is similarly connected through the points of Relay No. 1.

The regular local circuits run in the ordinary manner, when the armatures are closed.

On the back of each pair of Relay coils is a pair of local coils, wound on the same core with the mains.

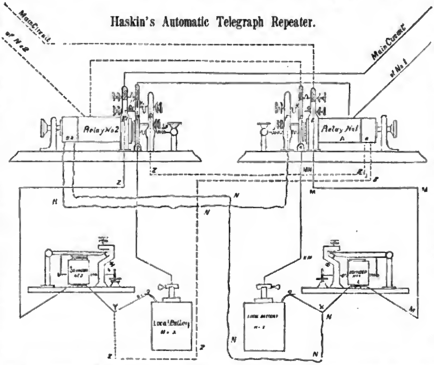
When the armature of either Relay is open, a connection is made with the local coil of the opposite Relay. We will trace the current from local Battery No. 1. The current passes to X, thence by wire N to the local coil B 2, on Relay 2, back by wire N to the back post F of Relay 1, across spring H, down armature lever D, and home to battery by wire M, N.

The object of this extra coil is to hold the receiving relay closed when its main circuit is broken, to prevent the Repeater from "breaking back."

The spring I and the back spring H must be so set, that when the armature lever is *closing* it will close on I before it opens on H, and *vice versa*. We will now explain the operation of the Repeater.

Suppose No. 1 to be repeating to No. 2, the armature of the receiving Relay No. 2 is held closed. When No. 1 closes, its armature closes the main circuit of No. 2 through the spring 1, and No. 2 is held closed by its own main current. When No. 1 breaks, its armature falls back, closing on spring H before opening on spring I, and thus (having previously broken the local circuit at G) the current from local No. 1 is thrown through the coils B 2, of relay 2, and actuating its core, holds the armature of No. 2 closed by *its* action, while main No. 2 is open. When No. 1 closes again, the main circuit of No. 2 is sent into No. 2 relay before the local current leaves B 2.

Haskin's Automatic Telegraph Repeater.



To Break.—No. 2 circuit being opened, the operator on circuit No. 1 breaks himself on the first dot, for when he closes, the armature of No. 1 closing, breaks the local circuit through B 2; and the main circuit of No. 1 being already open, the armature lever of No. 2 is drawn back by its spring J 2. This action opens line No. 1 on spring I 2 (and its own local at G 2), throwing the current of local No. 2 through spring H 2, and through the back coils of Relay No. 1, marked B, thus closing the main circuit of line 2 through the spring I. The sounders have no reference to, or connection with the Repater, and are only drawn to show the local connections.

This Repeater has been in use for a year past, and gives excellent satisfaction. Those using it claim that it breaks sharper than any in use. All who have used automatic Repeaters will see at once the advantage gained by repeating direct from the relay points, instead of from the sounders.

The U springs are furnished with a stop, preventing the spring from following the armature beyond a given point, when breaking, thus insuring a pefect opening of ths circuit each time, no matter how fast the writing.

Another advantage is gained by the use of this Repeater. The relays can be put on separate tables, and used as ordinary relays. By turning a switch on the base of each, they form a perfect Repeater.

The cheapness and simplicity of this Repeater commends it to practical men at once.

Bliss, Tillotson & Co., of Chicago, Illinois, are sole agents for the Haskins' Repeater. The price is $75. Mr. Haskins is an old and experienced operator, manager and superintendent.

A NEEDED REBUKE.

What a world of trouble might be saved all around by a little thought. One half of the beauties of our "square" system of tariff is not appreciated yet. Smaller offices do not realize that they can obtain any tariff they desire by simply asking the next on their circuit for it. Instead of doing so, what course is generally pursued where a message is sent to a town whose tariff is unknown? Take a common, every-day occurrence for illustration. Zanesville, Ohio, sends a message to Belknap, Iowa, and, looking on his book, finds Belknap isn't entered, and so something like the following is started: "To Belknap, Iowa—what's your tariff to Zanesville: ans. qck. Sig. Zanesville office." This Zanesville zips to Columbus; Columbus collars it to Cleveland; Cleveland clips it to Chicago; Chicago chucks it to Keokuk; Keokuk kicks it to Ottumwa; Ottumwa humps it to Belknap; and Belknap bellows back, "I'm in square 397." This, of course, is kicked and chucked back to Ottumwa, to Keokuk, to Chicago, to Cleveland, to Columbus, to Zanesville again, making a round dozen of repetitions that might have been avoided had Zanesville simply asked Columbus, "What square is Belknap, Iowa, in?" Columbus could have given him all the desired information in thirty seconds.

"C."

BENEFITS OF SCIENCE.

The practical view of agriculture cannot be more clearly or profoundly conceived than it was by the North American chief, whose speech on the subject is reported by Cérvecœur. The chief, in recommending agriculture to his tribe, the Mississipian Indians, said: "Do you not see that the whites live on corn, but we on flesh? that the flesh requires more than thirty moons to grow, and is often scarce? that every one of the wonderful seeds which they scatter on the soil returns more than an hundred fold? that the flesh has four legs to run away, and we only two to catch it? that the seeds remain and grow where the white man sows them? that the winter, which for us is the season for laborious hunts, is to them a time of rest?

It is for those reasons that they have so many children, and live longer than we do. I say, then, to every one that hears me, before the trees above our huts shall have died of age; before the maples of the valley cease to yield us sugar, the race of the sowers of corn will have extirpated the race of flesh eaters, unless the hunters resolve also to sow." In his difficult and laborious life of the chase, the Indian consumes in his limbs a large sum of force; but the effect produced is very trifling, and bears no proportion to the expense. Cultivation is the economy of force.

Science teaches us the simplest means of obtaining the greatest effect with the smallest expenditure of power, and, with given means, to produce a maximum of force. The unprofitable exertion of power, the waste of force in agriculture, in other branches of industry, in science, or in social economy, is characteristic of the want of true civilization.

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PNEUMATIC TUBES.

Pneumatic tubes for transmitting small parcels, or "carriers," containing telegrams, are now in use between different offices in Paris and London. Twelve of the principal offices in Paris are connected by these tubes The carrier consists of a brass box, shaped like a clock weight, placed inside a tightly-fitting case of hard leather. After many experiments, this form has been found the best adapted for the service. The messages are placed with addressed envelopes in the carrier, together with a list, showing the number and destinations of the messages. The carrier stops at every office on the route, that messages may be taken out and others put in. Each office is furnished with a Morse instrument and line wire. There is one main circuit 21,497 feet in length, two secondary, 17,350 feet and 16,617 feet, and a branch line 3,712 feet, making a total of 59,182 feet, or eleven miles. "The trains" start from the central station every 15 minutes, and make the circuit in about 14 minutes, stopping at five offices.

In London two methods have been adopted: one consists of a circuit or continuous tube leading from the central telegraph office to the general post office, and back to the starting place; the other of single tubes leading to separate offices. These tubes are of lead, about one and a half inches in diameter, and are inclosed in iron pipes for protection. The carrier is a small cylinder of gutta-percha, covered with cotton. Two, or even three, are sent at the same time. The transit occupies about one-half a minute through the longest tube, 3,600 feet in length.

A constant movement of the carriers is kept up in the circuit in both directions; they are placed in a loop of the main pipe, which is closed, and a valve opened into the main pipe, and by the same movement a column of compressed air is let in behind the carrier, which propels it through the tube into a similar tube at the other office. Another carrier can at the same time be sent from the other office, the air being exhausted from the tube.

The single tubes are operated in the same way. The carriers are sent by pressure, and returned through a vacuum. One engine only is required, which is at the central office, and works two large cylinders, one of which is used as a reservoir for the compressed air, the other for the vacuum. A nearly uniform pressure of eight pounds to the inch is maintained. The tubes are easily worked, and are tended by boys. Occasionally, in a rush of business, they become clogged, and the whole force of the compressed air is then turned into the pipe. If that is insufficient, a head of water, fifty feet in height, is added, and the carrier forced through. All communications relative to the use of the tubes are made by signals on telegraph wires.

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An Electric Joke.—Some weeks ago one of those Illegitimat Sons of Science, a vagrant electric man, opened out at Fourth and Market streets, with his dial for testing how much torture his voluntary victims could stand. To stimulate trade he kept a standing offer to pay $5 to whomever could stand as much of the electric fluid as his machine would furnish. One day a boy presented himself and announced that he had come to win that $5. The man handed him the "handles" and started the machine. The boy stood it wonderfully. The operator turned the crank faster and asked the boy how it felt. The boy said it did not feel at all. The man thought something must be the matter, and commenced an elaborate tightening up of the screws, and then commenced another series of swift revolutions, which ought to have produced a current sufficient to kill the boy, still he laughingly assured the fellow that he did not experience the slightest sensation. Out of patience the man demanded to see his hands, and then the secret was explained. The boy belonged at the telegraph office and had picked up one of the pieces of insulated wire now being put up inside the office, and had passed it up one sleeve of his coat, around his shoulders, and down the other sleeve, and then uncovered the end of the wires in each hand. Thus armed he had gone to the electric man, of course the uncovered ends of the wire pressed against the metallic handles presented a better medium than the boy's body, and the current simply passed to them and along the insulated wire around the boy's body without touching him. That "electrician" was very mad, and all the more so as the crowd drawn together thought it a good joke and took the boy's part. The man was so laughed at that he left town.

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PRACTICAL HINTS TO CARELESS MEN.

To the Editor of the Journal of the Telegraph :

Nova Scotia, March 15, 1871.

I do not know how it may be with other Nova Scotia offices, but I am constantly receiving "Error Sheets," in consequence of offices in the United States checking me "currency" instead of "gold" rates. I certainly fail to find any reasonable excuse for such bungling, there being, I presume, in all the Tariff books, as in mine, the "gold" and "currency" rates. If all the United States offices spend as much in postage as I do on this account, the Company will certainly be some dollars out of pocket, yearly, which might, with a little care and thought on the part of the employees, be saved.

A N. S. Operator.

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The cable between Malta and Alexandria, in the Mediterranean Sea, which cost the British Government two millions of dollars, has been sold to private parties for one hundred and twenty thousand dollars.

POWER FROM CHEMICAL CHANGES.

We cannot resist the publication of the following suggestive extract from a pamphlet just received from Mr. Highton, of Putney, England, some of whose articles on Magnetic Energy have already attracted so much attention:

> What an enormous generation of force and disturbance of chemical and calorific equilibrium can we produce by the mere application to a forest of a lucifer match or spark, which having once commenced the motion, this constantly reproduces itself, till in a few hours carbon and hydrogen have all become carbonic acid and water, and a grand disturbance of calorific equilibrium has been produced which takes ages to restore itself, till at last, again, in due time, by the re-growth of the vegetation, carbon, hydrogen, oxygen, caloric have recovered their original state; and all this grand revolution and restoration of forces—this regular round of chemical activity—has been produced by a lucifer match or spark? Nothing has been gained or lost; the heat produced by the combustion has again been absorbed by the growth of vegetation; and the carbonic acid, water, and other compounds have again resolved themselves into the shape of wood and leaves. And cannot we, by skill, without force, induce more or less of the combined electricities plus and minus, or of the combined heat and cold in matter, so to separate themselves that, by their re-combination, they may work for our benefit? This is the great physical problem of problems for science to solve. But if this is a problem beyond our power to solve, the next best thing to be attempted is to harness in our service the great powers of nature, to catch and force to our own use the circuits of electricity which are for ever circling the earth, and which hitherto we have only used to direct our magnets, and guide our ships; in fact, to mount, as skilful and well-taught Phaetons, the chariot of the sun, and force its four mighty steeds, strongest and mightiest of all steeds, heat, light, electricity, and chemical force, to work for us our ploughs, and looms, and engines, and drag our railway trains. Twice, indeed, every day as I sit and watch the Thames, I see the moon drawing up and down along its silent highway trains of barges; for does she not, as she goes round the earth, pull with her its tidal waters, with barges and all else that floats on them? I should like to see the sun put to the same kind of work, and as he rejoices like a strong man to run his race, to yoke him by the harness-cords of induction and conduction, and radiation, so as to force him to do for us more work, and to act more at our will and guidance, than we have hitherto forced or persuaded him to do.

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A USEFUL EXAMPLE.

Augusta, Feb. 9, 1871,

Dear Sir:—I have a local battery of 2 cups, and work with Williams' Sounder. I have run the battery just one year without cleaning or changing zincs, and have done it with just 6¼ lbs. vitriol, and to look at it to-day you would not know but what it was set up new within a few days. If any of your readers can do better, I will take a back seat. If not, I might give some hints in regard to taking care of a local battery that would be beneficial to some operators, and financially so to the Telegraph Co.

Yours truly,

E. H. Walker,
Augusta Dep
Operator and Ticket Agent, P. & K. R. R

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Professor Huxley says: Science is, I believe, nothing but trained and organized common sense, differing from the latter only as a veteran may differ from a raw recruit; and its methods differ from those of common sense only so far as the guardsman's cut and thrust differ from the manner in which a savage wields his club. The primary power is the same in each case, and perhaps the untutored savage has the more brawny arm of the two. The real advantage lays in the point and polish of the swordsman's weapon; in the trained eye, quick to spy out the weakness of the adversary; in the ready hand, prompt to follow it on the instant. But after all, the sword exercise is only the hewing and poking of the clubman developed.

Journal of the Telegraph.

This Journal will be issued on the 1st and 16th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, APRIL 1, 1871.

COMEDY OF ERRORS.

In the executive rooms of the Western Union Telegraph Co., N. Y., there is a Bureau of Errors. To it is referred the final examination and disposition of all complaints for alleged mistakes in handling the millions of messages sent over the Company's wires. Some of these are very amusing, and, could we do so with propriety, we would introduce our readers to the sacred inclosure, and give them the files to look over and laugh. Here is one item, however, too good to keep. The case is hard. It excites sympathy.

A clothing firm in the West, failed. At once an agent was sent to New York to compound with creditors. A compromise was speedily effected by an agreement to pay 60 cents on the dollar. Mordecai & Co. were happy.

It so happened, however, that one note of the western firm, which had been held in New York, for five or six hundred dollars, had been sent west for collection, and at the time of the negotiation for a compromise, was still there. In order, therefore, to bring that note in for the saving of 40 per cent. of its amount, it was necessary it should be *returned* to New York, and the agent very properly filed his message requesting the note to be *returned* to New York immediately, as everything else was all right. Unfortunately for the unfortunate debtor, some freak of the elements or atmospheric disturbance, occasioned, perhaps, by the interference of the chief signal officer "for the benefit of commerce," with the current of the winds and the condition of barometer &c. on Mount Washington, the word "*returned*" was translated "*secured*." And here is where the laugh comes in. The *failed* firm being advised that everything else was all right, actually paid their note *in full* without delay and strictly according to their legal obligations, and felt very happy until advised of the trick which the lightning had played upon them. Whereupon they waxed exceeding wroth and ignoring all natural causes—the Signal office included—files a formal complaint and make an indignant demand upon the Telegraph Company for the difference between 60 per cent. and the face of the note so paid, and threatens suit, of course, if this 40 per cent. is not immediately repaid to them by the Telegraph Company.

While the error department thinks it sad that the holder of the note should have received the full amount out of his unfortunate debtor, who had not the ability to resist the prompt payment of his note when he thought it necessary to do so, we don't quite see how the alleged error has done the complainant any legal injustice.

EXODUS.

On a fine frosty morning not many weeks ago, a mouse, just arrived at adolescence, sleek and fair and fat, found its way from its paternal hole under the floor of the executive rooms of the Western Union Telegraph Co., New York, to the top of a window in the fourth story of 145 Broadway, from whence the wires flow down to a stalwart pole in Liberty street. What brought the little rodent to so ambitious a height, and to such an uncheesy region, no one yet knows. He may have heard some discussion respecting removal, which indicated to his mousey mind the necessity of looking out for new quarters, and down below the well-worn floor he may have sung, before starting for those upper regions, "O, where shall rest be found!" He may have been, in some mousely sense, a stockholder, and, in dismay at the passing of two dividends, feared, (for mice are timid brutes,) that the executive lunches might be stopped also, and so, from lack of crumbs, his sleek brown hairs be brought to grief. Anyhow, there he sat, in the crisp air of a March morning, alternately washing his face, and anon looking out, like many another troubled shareholder, wondering what he had better do. He had read the morning sales, and stock was up. This he wondered at, and cocking his wise head aside, tried to solve the enigma. He looked down among the now busy operators, and saw the files full and their nimble fingers busy with the keys. Business seemed good. He saw, also, the General Superintendent, in through the evergreens which twine themselves about his window, and who he knew was sharp on rodents, looking serene and executive. Everything seemed to say "don't go," and that the W. U. was all right. But suspicion was up and the aspect was fair outside. The world looked bright and large. He didn't know these new men coming so often round his old quarters. So, deciding that he had seen the Western Union at its best, yet not without a little tremble about his ribs, he planted his fore-paws carefully down on a good bright wire that looked like a shining way to a shining shore, and started out on the narrow road. It was a bold step for a mouse. The wire led down steeply to a distant cross arm. It was a path on which no mortal mouse could ever hope to return. But off he went, and for a time dexterously succeeded in preserving his uprightness. By the time he had reached half-way, however, a crowd collected in the street. The windows were full of eyes. A hungry cat gazed out of the garret of the Associated Press. It was not strange that his feet should slip, and down he went, holding on with one claw. How sorrowfully he looked back up the mocking wire, and wished himself safely back in Western Union headquarters, who can express. The journey down was yet long and dangerous. A laughing crowd hooted on every side. Was ever mouse in such peril? And, to make matters worse, a Scotch terrier, with an eye to business, with a tail which wagged with hope, watched the wretched acrobat as he wriggled himself up and fell again at every foot of his descent. After many falls and brave recoveries, at last he reached a friendly joint about a foot from the glass. On this he rested long, and washed himself. He was nearly over Jordan. One bound more will reach the goal. So, after taking full compass of the distance, with special regard to the terrier below and the cat above, off he bounded. But, alas! not to reach the shining shore. In his uneasy wriggling a fine string had twisted round his tail, and by his caudal hold he hung suspended in mid air, amid the laugh and sympathy of a crowded sidewalk. A repairer mounted and relieved the discomfited rodent from his lofty swing, dropped him into a gamin's cap, from which he leaped only to meet the keen white teeth of the expectant pup.

Poor mouse! We pitied and would have saved thee. But thou wert not alone. We know several old mice who left Western Union much as thou didst, who now look over the market lists and shiver as they read "W. U. 39!" They went out at 40, and feel suspended much as thou didst by thy caudal extremity. And not a a few younger mice, who earned fair salaries but hugged imaginary sorrows, and who went out with high cockolorum and dignity, sometimes stand at the corner of the street and wish they were once more guarded and fed by the "great monopoly," under whose floor a mouse once fed and was happy.

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WOMEN telegraphers in this country are paid according to their skill, independent of sex. In other countries they are not so fortunate. The following, from an exchange, shows how they are treated in Sweden:

"Sweden employs women in her telegraph bureau, under very severe restrictions, however, which are not applicable to men. She must present a certificate from her parish priest, stating her age and attesting her moral and religious character. She must have a clear and legible handwriting, and be acquainted with the main outlines of universal history and of the history of Sweden in detail, as also with political geography, arithmetic to decimals and the rule of three, the Swedish grammar, and so much of French, German and English as may suffice to write and translate them into Swedish. The magnificent salary given her is from $100 to $140 per year, and she can retain her position as long as she remains single. The highest position she can ever hope to attain in the bureau gives her but $300 a year, and in order to achieve this she must wait years for a vacancy, and then pass a first-class examination in magnetism, electricity, and meteorology."

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Congress has granted permission to erect a monument at the intersection of two of the public streets in Washington, D. C., commemorative of telegraphic art. Professor Morse will, of course, be the central figure. On the frieze will appear the heads of W. W. Corcoran, Amos Kendall, Ezra Cornell, Hiram Sibley, J. H. Wade, and others. It will take several years to finish. The design is taken from the Columbus monument in Genoa. Although it was contemplated eighteen years ago, the success of the telegraphers' statue movement has quickened it into life. It will cost, when finished, $150,000. We shall rejoice to see it accomplished. It cannot rob the statue in Central Park of an atom of its significance as a token of personal esteem from the children of the telegraph to the father.

THE INAUGURATION.

As will be seen elsewhere the Inaugural ceremonies are postponed, until

THURSDAY, JUNE 8, 1871.

We regret, but cannot avoid this unexpected postponement. We have also to say that several communications have been received indicating a wide spread desire to be present on the occasion. Suggestions have also come, respecting a gathering of Superintendents. I have presented these to the President, who has replied to me as follows:

> "I do not feel justified in sending out invitations to the employees of the Company to leave their duties, but if applications for leave of absence are made to the General Superintendents, and I am consulted in the premises, I shall feel inclined to have leave given as generally as practicable, without impairing the efficient working of the lines."
>
> WILLIAM ORTON, *President.*

This is all which can be asked. The General Superintendents will no doubt do what they can, consistent with their public duties, to serve those who desire to be present. J. D. R.

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Death has been busy at 145 Broadway, New York, Within the past three months five have departed. Three were resident; the other two—one had just left for a distant service the other to recruit. Here is the roll:—Gideon Tucker, Josiah A. Cure, George Clark, George D. Sheldon, George Seibert.

Only one of these (Dr. Cure) was connected with the Telegraphers' Mutual Life Insurance Association. Notices of the first three have been already made. Let us say a word of the two last.

George D. Sheldon died in New York, March 17, from the effects of an abscess. He belonged to the service of the Cable and general Superintendent's rooms, where he was much esteemed and trusted. He was in mature age—nearly 45—and had unusual natural ability. He was at one time manager of the Chicago office, was an accomplished scholar, of peculiarly quiet and undemonstrative manners, attaching others to him by his personal refinement and gentleness. He was unmarried, yet leaves a large circle of relatives and friends to miss him and mourn his loss.

George Siebert was young, gentle, and true, a Christian man whom all his associates respected and loved. He has long been poorly, and gradually faded away. The operating room of 145 Broadway has had no better man sit at its desks. He was a true, brave, laborious man, never repining, though he long saw the shadow on the wall, and suffered much before he found his welcome rest. He died of consumption at midnight of March 20, after eleven years of faithful service, in his 23d year, at his father's house, Fifty-third street, New York, and was buried in Greenwood. The six pall-bearers were Mr. Brown, chief manager, chief-operator Applebaugh, and Messrs. Brennan, Nightingale, Dealy and Christie.

Mr Siebert always stood well with the company, whose interests he zealously made his own. For some time before his death he worked the New Orleans wire, which, on account of its great length, and the number of repeaters in circuit, required careful manipulation and patience. His latest duties were in the cable room, where he carried a like fidelity, and where his earthly walk ended. He fell asleep in Christ.

These many deaths have not been without their influence. They have induced thoughtfulness with regard to life's true meaning, and its connection with the hereafter. They also inspire a deeper fellowship and courteousness, so that death may have no upbraidings and unkind memories when the grave makes penitence too late and forgiveness impossible.

◆

PUTT'S MECHANICAL TELEGRAPH.

The Mechanical Telegraph Instrument manufactured by L. G. Tillotson & Co., of New York, having been claimed by Messrs. Putt & Co. as an infringement of their patent, that firm, with their usual sense of justice and fairness, have not only withdrawn their instrument from the market, but will hereafter furnish the Putt instruments at the usual price to all who prefer to order through them. To all who order from either Putt & Co., Wellsville, O., or Tillotson & Co., N. Y., Smith's Manual, published by L. G. Tillotson & Co., will be sent free. The instructions in this Manual are particularly adapted to those who wish to learn by sound. We recommend these Mechanical Telegraph Instruments as very neat and ingenious, and Putt & Co. are in daily receipt of the highest encomiums from its many purchasers.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
April 1, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since March 15, the date of the last tariff order.

Managers are hereby required to enter these changes into their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

*	Bryn Mawr, Pa.
110	Adams Basin, N. Y.
301	Allinsville, Ky.
	Anaheim, Cal., 150 more than San Francisco, Cal.
40	Athens, N. Y., re-opened.
296	Benton, Ala.
76	Bear Valley, Pa.
*	Casey, Ill.
*	Collinsville, Ill.
138	Chippewa, Mich.
219	Ellaville, Fla.
*	Greenup, Ill.
*	Greenville, Ill.
*	Highland, Ill.
*	Jewitt, Ill.
76	Lykens, Pa.
*	Marshall, Ill.
*	Martinsville, Ill.
*	Mul Grove, Ill.
58	Neshanic, N. J.
*	Pocahontas, Ill.
281	Plainfield, Ind.
140	Raymelton, Pa.
18	Randolph, Mass.
298	Spencer, Ill.
418	St. Catharine, Mo.
331	Saltillo, Miss.
*	St. Elmo, Ill.
*	St. Jacobs, Ill.
140	Saxonburg, Pa.
*	Troy, Ill.
76	Wiconisco, Pa.
76	Williamstown, Pa.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.	*Leaves this Line.*
Bryn Mawr, Pa.	Same as Whitehall, Pa.	Same as Whitehall, Pa.
Casey, Ill.	60 4 60 4	Terre Haute, Ind. Effingham, Ill.
Collinsville, Ill.	95 8 75 6	Terre Haute, Ind. Effingham, Ill.
Greenup, "	60 4 60 4	Terre Haute, Ind. Effingham, Ill.
Greenville, "	85 5 60 4	Terre Haute, Ind. Effingham, Ill.
Highland, "	90 7 70 5	Terre Haute, Ind. Effingham, Ill.
Jewitt, "	60 4 40 2	Terre Haute, Ind. Effingham, Ill.
Marshall, "	40 2 70 5	Terre Haute, Ind. Effingham, Ill.
Martinsville, "	50 3 65 4	Terre Haute, Ind. Effingham, Ill.
Mul Grove, "	85 5 60 4	Terre Haute, Ind. Effingham, Ill.
Pocahontas, "	85 5 70 5	Terre Haute, Ind. Effingham, Ill.
St. Elmo, "	75 5 40 2	Terre Haute, Ind. Effingham, Ill.
St. Jacobs, "	90 7 75 5	Terre Haute, Ind. Effingham, Ill.
Troy, "	90 7 75 6	Terre Haute, Ind. Effingham, Ill.

OFFICES CLOSED.

Bijou, Col.; Cherokee, Ala.; Georgetown, Mass.; Hopefield, Ark.; Lauderdale, Miss.; Mittineaque, Mass.; Whiteland, Ind.

GENERAL INFORMATION.

Managers are again instructed that no order giving changes in tariffs on this line, unless specially directed, should be understood as increasing existing rates.

Great Bend, Pa., heretofore in Square 75, will hereafter be in Square 65.

The tariff from offices which are at present without rates to points on Erie line, given in last JOURNAL, in the same Square as themselves, will be 35c.

The name of the office heretofore known as Venango City, Pa., has been changed to East Side Oil City, Pa.; White Oaks, Pa., has been changed to Trunkeyville, Pa., Sq. 130, and Montpelier, Ind., to Keystone, Ind., Sq. 252.

Morrison, Ill., in Sq. 246, is in Whiteside county; Morrison, Ill., in Sq. 337, is in Christian county. Care should be taken in addressing messages or letters to either of these offices.

No "half-rate" messages should be taken for or received from Camden, S. C.

The new office at Osage, Ks., Sq. 457, was incorrectly given Osage, Ka., in JOURNAL of Feb. 1st, 1871, and Nov. 15th, 1870.

Alexander, N. Y., is in Sq. 120, not 110 as per last JOURNAL.

CHANGES IN RATES TO POINTS ON P. E. I.

On and after April 1st, the "tariff for other lines" from Sackville, N. B., to offices in Prince Edward's Island will be 85 and 8 on business from points in the United States, and 75 and 8 on business from points in Nova Scotia and New Brunswick.

ATLANTIC CABLE BUSINESS.

We are notified that the route to Alexandria, India, &c., "via Falmouth," is again in working order. Messages may be directed that way by the insertion of the words "via Falmouth," which must be charged for as far as London.

The British Australian cable is broken between Singapore and Batavia. Messages for Batavia, and points on the Islands of Java and Sumatra, must be posted at Singapore, charging 37½ cents postage in addition to the Singapore rate.

On and after April 1st, 1871, American, English and French government messages will be charged half cable rate, that is: messages in plain, ordinary language, half ordinary public rate; and on cypher messages half cypher rate. For messages beyond New York and beyond England and France the FULL ADDITIONAL RATES must be added.

We are notified, also, of the following alterations in charges *beyond* LONDON for messages to the following points:

	Message of 10 Words.	*Message of 20 Words.*
To all stations in Persia, inclusive of Bushire	$5 00	$6 12
Kurrachee and all stations in Beludschistan	16 00	20 12
Penang		23 50
Singapore		27 50
Java, Batavia and Welter Vreden		30 50
" West of Samarang		30 75
" East of Samarang		31 25

WILLIAM ORTON, President.

◆

MORSE TESTIMONIAL FUND.

POSTPONEMENT OF THE INAUGURATION.

We are, with great reluctance, compelled to postpone the ceremony of inaugurating the Morse Statue until

THURSDAY, JUNE 8, 1871,

at which date it will positively take place. The cause of this postponement is the receipt of the following letter:

NATIONAL ART FOUNDRY,
New York, March 27, 1871.

DEAR SIR: In answer to your enquiry whether there is any doubt of the Statue of Prof. Morse being ready for placing on its pedestal by the 25th of April, I am compelled to reply that I cannot give a positive assurance to that effect. The moulders are pushing on their work as rapidly as possible, but I am unwilling that a work which has been so skillfully designed should be imperfectly delivered, anxious though I am to comply with your wishes. I need a month longer to do the work justice.

Very respectfully yours,
MAURICE J. POWER.

This is a great disappointment, yet one to which we must submit. Perhaps it may be better so. Summer will then be with us in her beauty and bloom, and more may be able to reach the city.

The fund stands to-day, March 31:

Balance due on Statue.......... $296 65

RECEIVED SINCE OUR LAST.

THE UNITED RAILROAD TELEGRAPHS OF NEW JERSEY.

Dear Sir:—Please find my check for ninety-five (95) dollars and fifty (50) cents, contributed by the operators in the employ of the United Railroad companies of New Jersey, to the Morse Testimonial Fund, of which you are the chairman. Geo. B. Pennock, Esq., manager W. U. Tel. office in this city, deserves much credit in assisting to raise the above amount. The boys have done nobly.

Yours truly, R. STEWART.

BORDENTOWN, March 22, 1871.

R. Stewart, Supt., Bordentown, N. J.	$5 00
H. N. Silver, train dispatcher, Bordentown, N. J.	1 00
John W. Truan, train dispatcher	1 00
G. B. Pennock, manager, Bordentown, N. J.	1 00
M. Maitland, operator, Bordentown, N. J.	1 00
Jos. I. Osmond, operator, Bordentown, N. J.	1 00
James E. Foley, operator, Bordentown, N. J.	1 00
Geo. M. Hamilton, line repairer, Bordentown	1 00
Wm. Dunn, operator, Florence, N. J.	1 00
Wm. A. Worrell, operator, Florence, N. J.	1 00
J. Hoffman, operator, Newtown, N. J.	1 00
William Mortimer, operator, Newtown, N. J.	1 00
C. E. Liming, operator, Jamesburg, N. J.	1 00
D. F. Stonaker, operator, Jamesburg, N. J.	1 00
Geo. S. Counter, operator, Jamesburg, N. J.	1 00
Isaac A. Shreve, operator, Hightstown, N. J.	1 00
W. W. Deacon, operator, Delanco, N. J.	1 00
Samuel L. Hawk, operator, Palmyra, N. J.	1 00
Wm. P. Harris, operator, Camden, N. J.	1 00
Robert S. Dougherty, operator, Camden, N. J.	1 00
Daniel Snowhill, operator, Spotswood, N. J.	1 00
William F. Rickard, operator, Spotswood, N. J.	1 00
I. S. Van Duesen, operator, S. Amboy, N. J.	1 00
A. Miller, operator, S. Amboy, N. J.	1 00
F. C. Tobias, operator, S. Amboy, N. J.	1 00
James Forman, messenger, S. Amboy, N. J.	50
Charles L. Norris, operator, 2d sub., Pier 1, New York	1 00
L. N. Stevenson, operator, Sharon, N. J.	1 00
Geo. C. Levins, operator, Cream Ridge, N. J.	1 00
R. Wolcott, operator, New Egypt, N. J.	1 00
D. H. Aaronson, operator, Wrightstown, N. J.	1 00
John H. Reeves, operator, Pemberton, N. J.	1 00

Harry B. Antrim, operator, Pemberton, N. J.	50
W. B. Scattergood, operator, Mount Holly, N. J.	1 00
Geo. W. Bodine, messenger, Mount Holly, N. J.	1 00
D. T. Carty, operator, Medford, N. J.	1 00
R. Stimers, operator, Moorestown, N. J.	1 00
T. B. Sage, operator, Merchantville, N. J.	1 00
E. H. Brock, train dispatcher, Jersey City, N. J.	1 00
Wm. Ettenger, operator, Jersey City, N. J.	1 00
A. B. Crane, ex-operator, Jersey City, N. J.	1 00
Geo. H. Tung, operator, Jersey City, N. J.	1 00
F. T. Weiss, operator, Marion, N. J.	1 00
J. Van Wagoner, operator, Marion, N. J.	1 00
F. P. Wycoff, operator, Meadows, N. J.	1 00
S. Jemison, operator, Meadows, N. J.	1 00
Henry Miller, S. Elizabeth, N. J.	50
Andrew Reeder, operator, Jersey City, N. J.	1 00
J. W. Ayden, operator, Market st., Newark, N. J.	1 00
J. B. Burley, operator, East Newark, N. J.	1 00
Geo. W. Conner, operator, King st., Newark, N. J.	1 00
Samuel Whitely, operator, N. Elizabeth, N. J.	1 00
Wm. Wiseman, operator, Elizabeth, N. J.	1 00
L. C. New, operator, S. Elizabeth, N. J.	1 00
J. T. Williams, operator, Linden, N. J.	1 00
E. Terrill, operator, Metuchen, N. J.	1 00
Samuel S. Cox, manager, New Brunswick, N. J.	2 00
W. W. Montalvo, ex operator, New Brunswick, N. J.	2 00
F. G. Reed, operator, New Brunswick, N. J.	2 00
E. Headly, operator, E. Brunswick, N. J.	1 00
J. F. Schenck, operator, E. Brunswick, N. J.	1 00
John Reedy, operator, 4 Mile Tank, N. J.	1 00
A. T. G. Colby, operator, Mon. Junction, N. J.	1 00
E. B. McCarty, ex operator, Mon Junction, N. J.	1 00
A. C. Cass, operator, Mon Junction, N. J.	1 00
H. H. Adium, operator, Principal Junction, N. J.	1 00
E. C. Davis, operator, Principal Junction, N. J.	1 00
E. C. Seely, operator, Lawrence, N. J.	1 00
S. W. Labaw, operator, Lawrence, N. J.	1 00
C. P. Curtiss, operator, Trenton, N. J.	1 00
G. W. Waite, operator, Trenton, N. J.	1 00
W. B. Summers, operator, Trenton, N. J.	1 00
John B. Boyce, operator, Morrisville, Pa.	1 00
Geo. Houghtling, operator, Morrisville, Pa.	1 00
M. B. Wright, operator, Tullytown, Pa.	1 00
S. H. Cooper, operator, Tullytown, Pa.	1 00
J. M. Brown, operator, Bristol, Pa.	1 00
C. Brown, operator, Bristol, Pa.	1 00
G. B. Wilde, operator, Cornwells, Pa.	1 00
J. W. Wynn, operator, Cornwells, Pa.	1 00
S. B. Callahan, operator, Holmsburg, Pa.	1 00
C. B. Spain, operator, Frankford, Pa.	1 00
John O. Chambers, operator, Kingston, Pa.	1 00
Oliver Decker, operator, Kingston, Pa.	1 00
W. H. Thorn, operator, Mantua, Pa.	1 00
Harvey B. Miller, operator, West Philadelphia, Pa.	1 00
J. T. Morrell, citizen, Beverly, N. J.	50
E. C. Tompkins, operator, Beverly, N. J.	1 00
A. G. McKee, operator, Beverly, N. J.	1 00
E. S. Snyder, ex. constructor, Beverly, N. J.	50
Eugene M. Deacon, operator, Burlington, N. J.	1 00
Total	$95 50

T. J. King, operator, Baltimore, Md.	$1 00
J. M. Dunsmore, Iola, Kansas	1 00
T. J. Smith, manager, Hoboken, N. J.	1 00
M., Southport, Conn.	1 00
Laura Crissman, manager, Phillipsburg, Pa.	1 00
J. T. Anderson, Allentown, Pa.	1 00
F. J. Remmel, Allentown, Pa.	50
W. Baker, agent S. C. R. R. and manager, Hartford Mills, N. Y.	1 00
O. N. Perry, Oxford, N. J.	1 00
O. G. Turner, manager, Augusta, Me.	2 00
J. Case, supt. construction, Cent. Div. W. U. Tel. Co.	5 00
Hattie W. Ingersoll, manager, Danville Junction, Me.	1 00
Hattie A. Doe, night manager, Danville Junction, Me.	1 00
W. H. Eckman, ex-telegrapher, St. Clairsville, O.	1 00
Capt. Abraham Rich, Hallowell, Me.	1 00
Noah Loder, New York	1 00

NORTH MISSOURI RAILROAD TELEGRAPH.

D. H. Fitch	$5 00	F. M. Fawcett	$1 00
Geo. P. McAlvery	1 00	H. Kittle	1 00
B. W. Ammerman	1 00	A. W. Stickle	1 00
E. P. Ammerman	1 00	J. H. Gutheridge	1 00
D. Henderson	1 00	J. A. Vanwinkle	1 00
J. J. Phillippi	1 00	W. R. Hollingsworth	1 00
James Ferguson	1 00	J. D. Gunn	1 00
M. H. Garwood	1 00	Mary E. Collett	1 00
W. H. Winfield	1 00	J. L. Fisher, repairer	1 00
Geo. Huggans	1 00	James Hunt, messenger	25
Total			$23 00

SUPPLY DEPARTMENT, NEW YORK.

T. F. Stevens, supply dept.	$1 00
A. K. Watson, storekeeper (2d sub'n.)	2 00
John Spellman, insulator shop	2 00
John Dooley, insulator shop	1 00
William Oliver, insulator shop	50
Richard Oliver, insulator shop	50
John Mahoney, insulator shop	50
John Margins, insulator shop	50
Total	$8 00

KANSAS PACIFIC RAILWAY TELEGRAPH.

O. H. Dorrance, supt., Ks.	$5 00
Orlando Branham, operator and agent, Stranger, Ks.	1 00
H. B. Hunt, operator and agent, Edwardsville, Ks.	1 00
E. B. Linton, operator and agent, Tonganoxie, Ks.	1 00
Thos. J. Stout, operator and agent, Tonganoxie, Ks.	1 00
F. C. Jackson, operator, Manhattan, Ks.	1 00
Jno. J. O'Rorke, operator, Wyandotte, Ks.	1 00
Jno. D. Cruise, ex operator, Ks.	1 00
Total	$12 00

"Let brotherly love continue."

PHIDADELPHIA—SECOND SUBSCRIPTION.

D. H. Bates	$1 00	John E. Zeublin	$1 00
Henry Bentley	1 00	Foster W. Davis	1 00
Evening Telegraph	1 00	John A. Hennesberry	1 00
W. W. Harding	1 00	Dr. Bradley	1 00
Philadelphia Inquirer	1 00	S. A. Boyle	1 00
Wm. B. Gill	1 00	Charles K. Hambright	1 00
Wm. Carley	1 00	John Wintrup	1 00
G. W. Porter	1 00	H. Carnog	1 00
H. C. Robinson	1 00	James L. Mingle	1 00
Suel Smith	1 00	James Merrihew	1 00
Total			$24 00

TROY, N. Y.

DEAR SIR: As your work on behalf of the Morse Testimonial is about drawing to a close, by the completion of the list, I take much pleasure in adding a mite by enclosing to you the following additions to my former list.

Yours, very truly,

A. PRESCOTT, *Manager.*

W. H. Poor	$5 00	C. W. Witbeck	$1 00
W. H. Ashby	1 00	C. H. Witbeck	1 00
Geo. Babcock	1 00	P. H. Mitchell	1 00
Geo. H. Otis	1 00	J. E. Dunker	1 00
Total			$12 00

D. J. Flanders, operator, B. and M. R. R. Boston........ 1 00

WEST VIRGINIA.

The following was mailed Feb. 22d, but, from some cause, never came to hand until now a duplicate is received. The letter is accompanied with the heartiest desire of all for complete success:—

A. T. Cline, Grafton, W. Va., 2d sub.	$3 00
Geo. G. Smith, operator, Grafton, 2d sub.	1 00
Edward Manlin, lineman, Grafton, W. Va.	1 00
M. P. Jordan, messenger, Grafton, W. Va.	50
D. M. Sharpnock, operator, Petroleum, W. Va.	3 00
T. W. Reitz, operator, Petroleum, W. Va., 2d sub.	2 00
C. H. Brown, operator, Volcano, W. Va.	2 00
J. L. Courtright, operator, Glover's Gap, W. Va.	1 00
J. E. Hipsley, operator, Glover's Gap, W. Va.	1 00
W. F. Courtright, operator, Glover's Gap, W. Va.	50
E. D. Walker, operator, Fairmount, W. Va.	1 00
Thos. Fitzgerald, operator, Fairmount, W. Va.	1 00
W. Shock, operator, Rowlesburg, W. Va., 2d sub.	1 00
H. Tab, operator, Rowlesburg, W. Va., 2d sub.	1 00
D. C. Mudge, operator, Eaton Station, 2d sub.	1 00
Total	$20 00

We are happy to be able to acknowledge receipt of fifty dollars towards the special fund for masonry, architecture, etc., from Geo. H. Thurston, Esq., President of the P. and A. Telegraph Co., Pittsburg, Pa., and which leaves that fund with only $126 to complete.

◆

To the Editor of the Journal of the Telegraph :

SHELBYVILLE, MO., March 21, 1871.

The citizens of our little town have raised money for the purpose of building a line from this place to Shelbina, a distance of 8 miles. The work has already begun. We will have it in working order by the middle of April next. We have permission from the W. U. Co. to run our line into their office at Shelbina. The line will be styled The Shelbyville and Shelbina Telegraph Co.

Yours, C. B. DUNCAN.

◆

Will two wires from the binding posts of a relay, dipped in a cup of water, act as a lightning arrester. If so, why so?

Yours, &c., E.

If the two wires leading to a relay have branches which touch water in a cup at opposite sides, the relay may be saved in a flash of lightning by the water conducting it from wire to wire outside the relay. In that sense only is the water an arrester. You must first make sure that the battery current is not itself "arrested" by giving it a conductor outside the relay.

TELEGRAPHERS' MUTUAL INSURANCE ASSOCIATION.

ASSESSMENT NO. 19.

19	22	23	84	237	252	262	263	264	265	266
315	349	412	588	642	660	677	694	787	796	799
801	851	878	916	929	987	1031	1032	1033	1034	

ASSESSMENT NO. 20.

15	19	22	23	27	29	31	70	80	114	117
120	121	127	128	206	237	240	246	253	256	262
263	264	265	266	271	298	315	318	319	332	335
336	337	342	343	379	385	412	434	440	447	456
483	524	529	536	555	556	557	562	570	581	602
629	630	669	677	694	712	734	747	761	782	783
784	785	786	787	788	790	801	803	808	836	837
838	841	848	861	868	878	882	896	900	904	907
911	915	920	929	944	947	985	994	996	1030	1031
1032	1033	1034	1039	1041	1060	1066	1069	1084	1085	

◆

Sending half rate messages, when tariff is 55, should I charge 30 or 28 cents *for ten words?* I notice some offices check me 30 and others 28 cents. This makes many errors in checks.

Where the tariff for a full rate message is 55 cents, charge 28 cents for a half rate message.

◆

On March 16 Mr. Ramsay again presented the Postal Telegraph Bill to Congress. It was referred to the Committee on post-roads and post-offices. There it sleeps. It is, in all its essential features, the Hubbard system, and has no chance of immediate consideration or of future passage.

◆

Extract from a letter from Supt. Van Horne. "Jake's" many friends will be glad to hear of him. His photo is worth looking at.

"I saw 'Jacobo' Campbell. He has become a man of somewhat ponderous proportions. He wished to be remembered to you. He has a Mexican wife and three "childer." They don't speak much English in that family. I slept one night under his tent on the Rio Grande."

◆

BORN.

To L. C. Orvis, Manager of the Western Union Telegraph Office, Manchester, Vt., March 21st, 1871, a son.

At Newark, N. J., on the 23d inst., the wife of John K. Knapp, clerk, N. Y. Stock Exchange, of a daughter.

To William K. Applebaugh, New York, March 30, a daughter.

MARRIED.

LEWTER—WOODS—At the residence of the bride's father, in Pitt County, N. C., on the 19th inst., by the Rev. Mr. Cunningham, Mr. A. Saunders Lewter, Manager Western Union Telegraph Company, and Agent for the N. C. R. R. Co., Durham, N. C. to Miss Carrie W. Woods. No cards.

SMITH—WILLARD.—March 16th, at the residence of Mr. Barney Hatch, Kent, Conn., by the Rev. Mr. Scudder, Charles S. Smith, manager W. U. Telegraph office, to Miss Ella C. Willard, of Ravenna, Ohio.

INTERESTING TO ALL OPERATORS.

A HANDSOME

8x10 PHOTOGRAPH,

SUITABLE FOR FRAMING,

OF THE

FIRST TELEGRAPHIC INSTRUMENT

USED BY MORSE AND VAIL

ON THE EXPERIMENTAL LINE BETWEEN BALTIMORE AND WASHINGTON, IN 1844,

and on which the FIRST MESSAGE WAS SENT, together with a FACSIMILE OF PROFESSOR MORSE'S CERTIFICATE AS TO ITS GENUINENESS, and HANDSOME PHOTOGRAPHS OF FRANKLIN, MORSE, VAIL, and FIELD in an appropriate border.

☞ See full accounts in all the papers.

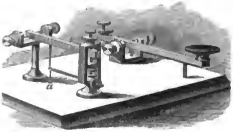
No operator should be without this most interesting reminiscence of the early days of Telegraphy.

Single copies, postage paid, 75 cents; 10 copies for $6; 20 for $10. Address

S. S. THOMPSON,
Telegraph Operator,
Morristown, N. J.

MECHANICAL TELEGRAPH INSTRUMENT,

PATENTED MAY 31st, 1870.



For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art,

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

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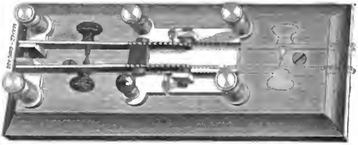

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I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officess shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and th payment of dues.

XI. A meeting for the election of officers shall be held annually during th first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy ntil the time of the annual election.

XII. Special meetings of the association may be called upon the written reques of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer.

GERRITT SMITH, Secretary.
A. S. BROWN,
W. H. HILL,
D. R. DOWNER,
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DIRECTIONS TO APPLICANTS.

1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to Gerritt Smith, Secretary Telegraphers' Mutua Life Insurance Association, 145 Broadway, New York, and a certificate of membership will be sent by return mail.

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

5. No letters can be answered unless a stamp is enclosed for postage; and as the officers labor without compensation, correspondence requiring answers should be as limited as possible.

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LITERATURE.

Electrical Tables and Formulæ for the Use of Telegraph Inspectors and Operators. By LATIMER CLARK and ROBERT SABINE. London: Spon Brothers, Charing-Cross.

If "telegraph inspectors and operators" understand how to apply all that is contained in the book before us, to what point of erudition must not the telegraph engineers have arrived? We are not ourselves telegraph engineers, and, therefore, we are unable to fathom the profound depths of learning into which that branch of civil engineering may not, unknown to us, have plunged. But in this regard they most certainly differ in many main points from their less fortunate brethren in the humbler walks of the profession. When will that happy time arrive when our clerks will keep our books by the method of double-integral-calculus-entry, and our draughtsmen apply the higher mathematics to the ordinary work of our drawing offices? And when it has arrived, to what celestial heights of moderate omniscience may not the editors of this fortunate journal, in company with the host of No. 25 Great George street, expect to soar? Perhaps telegraphy owes more to science than any other branch of civil engineering does; the reason of this is that it is scarcely possible to arrive at any moderately satisfactory result without applying continuously to scientific knowledge. In common gratitude, therefore, electricians cannot, when they arrive, by the aid of science, at what they want, cast her aside. There is, indeed, little inclination on the part of electrical engineers generally to do so; because in handling this subject, in however mechanical a way, the engineer (but not necessarily the operators) must be imbued with a taste, more or less deeply, for scientific information and research. In any such art-science as telegraph engineering, the danger is that the earlier workers will be, for the most part, composed of two classes: the one made up of mere mathematicians, the other of mere uninformed mechanics. And between these two there will exist a rivalry which is detrimental to the progress of an exact knowledge of the subject. A few years ago, when the first Atlantic cable was laid, a happy combination of scientific knowledge and mechanical ability had already made great strides toward the present state of things. There were, however, still marked remnants of the class who developed formulæ based on theoretical views only, which were doomed to lie for years unapplied to any practical purpose. There were still also remnants of the class which blundered upon results, the value of which was lost because their reasoning was unguided by principle and generally wrong. Twenty years ago Professor Pole pointed out that the only practical way of arriving at just conclusions between these two classes was to combine them, and we have seen how wonderfully such a combination has, in the instance of many gentlemen still laboring in the field of telegraph engineering, been successful. Illustrious instances of such a happy combination are not wanting in single individuals, and among the foremost of these are Sir Charles Wheatstone and Sir William Thomson, both of whom are erudite philosophers, and, at the same time, expert mechanists.

Mais revenons à nos moutons. We sat down to review Messrs. Clark and Sabine's book, and not to write the characters of philosophers. The book before us is the most unreadable book, next to Bradshaw, that we ever held in our hands; and to review it systematically would be about as difficult, if not impossible a task, as to review that same indispensable and puzzling publication.

The book opens with a chapter on units, in which the units of electrical measurement recommended by the committee of the British Association have been adopted as established measures, because, as the authors tell us, they (the units) "are the most rational and concordant." The elder units have a biographical chapter devoted to them, in a charitable sort of way, which is evidently intended to celebrate their interment. Whilst they lived they did good service. Now they are defunct; peace be unto their ashes.

The new units are as follows:

Resistance.—One ohm is about 5 per cent. greater than a Siemen's mercury unit.

Electro Motive Force.—One volt is about 7 per cent. smaller than the force of a Daniell's element.

Quantity.—One veber is the quantity which flows, per second, through one ohm whose ends have a constant tension of one volt.

Capacity.—One farad is the capacity per charge, which takes one veber, when the two sides of the condenser have a tension of one volt.

This is clearly an improvement upon the old style, when every body had its own unit, and nobody was able very clearly to tell what his own unit was, at least if we may judge from the long-sustained squabbles in which the advocates of certain systems occasionally indulged.

After passing over a few pages we come to a series of chapters on the Laws of Galvanism, Induction, Magnetism, &c., which have been culled from a great variety of sources, as it would appear, and form a portion of the book which will find special appreciation amongst those who like useful information unembarrassed by mathematical formulæ.

If Messrs. Clark and Sabine can tell us of an inspector or operator who understands their chapter on Faults, we shall be prepared to place him, without further question as to his sobriety or honesty, on the staff of this paper. But apart from the fault of theirs—that of addressing the right thing to the wrong man—the chapter is a valuable one, and our opinion is that, in the face of that chapter, a fault in a cable would show weak-mindedness on the part of the cable, because it must inevitably be detected and treated accordingly.

The chapters on Materials—copper, iron, gutta-percha, india-rubber, &c.—are, it would seem, only extensions of those given in Mr. Clark's book on "Electrical Measurement."

Sir Charles Wheatstone's contribution of tables for assisting the reading of telegraph despatches in the Morse character, which, if not quite original, is at least useful.

The chapters on Hemp and Asphalte are novel, and will supply an admitted want.

If we may form an opinion of the probable utility of this conjoint work by the acknowledged utility of those which Mr. Latimer Clark and Mr. Robert Sabine have separately written, we should prophesy it a ready acceptance.—*Engineering.*

IMAGINATION IN SCIENCE.

Professor Tyndall will eventually have much to answer for. He has lent his authority to the admission of imagination in the pursuit of science, and there is every prospect that people whose imaginative faculty is stronger than their habit of observation will give us all plenty to do. We shall not only have to question nature, but we shall have to eliminate imagination, and thus have two battles to fight for truth. Our medical friends have not always walked in the ways of rigid observation and induction, but if any one desires to see how easy it is for the imaginative faculty alone to tell us all we require to know, we commend to his perusal the *Mobile Daily Register*, of Dec. 18, 1870, in which there is a communication from Dr. Cochrane, on the subject of yellow fever, well written, and interesting, and giving what may be called an account of yellow fever from the imaginative side. The author justifies his position by the example of European names, tells us candidly that he states only "what he believes but does not know," and then takes his flight into the unknown. He imagines "the yellow fever poison to be composed of living germs in innumerable number, living organisms of inconceivable minuteness, which eat and drink, and multiply their generations under the sun, just as other living creatures do with which we happen to be familiar." He connects his speculations in these matters with similar speculations about "contagia" and disease "germs" which are well known on this side of the Atlantic, and without paying any attention to facts regarding yellow fever and other diseases which are left untouched by any extant doctrine, he tells us truly that "the visions of modern science are more wonderful than the visions of Eastern fable." This may be true, and the visions themselves may be true; but, for people who feel that they must walk over the earth in search of truth, nutriment of this kind is by no means sufficient for mental sustenance.

We have no desire to undervalue the importance of the imaginative faculty in scientific pursuits; but papers such as the one before us raise some very important primary questions. Are we to live, scientifically, in the same way as alchemists and astrologers did in the Middle Ages? And are we to ignore all that Bacon and Newton have done for us? If it be true that there is no royal road to knowledge on the firm earth, it is certain there is no such road through the air. Let us use the imaginative faculty by all means; but, in doing so, let us take our stand on the firm ground of the known before we venture ourselves into the unknown.

BALL LIGHTNING.

By C. F. Varley.

With a "Holtz's" machine, which will give 11-inch sparks in the air, four well-marked different kinds of discharge have been obtained *in the air;* one of which, the author thinks, will explain the curious and rare phenomena known as "ball lightning."

In the experiments hereafter referred to, the condensers were, in all cases, attached to the "Holtz's" machine. The first discharge is the long 11-inch zigzag spark or lightning-flash: the second is the well-known "brush," which is best obtained by connecting the negative pole of the "Holtz's" machine to the earth; the third kind of discharge is a hissing red flame, one-half inch in length, playing about the negative pole, the positive pole being scarcely luminous at all, and if luminous, at one or two points only; the fourth or most remarkable phenomenon is best obtained in the following manner (I should here remark that the brass balls on each of the poles are about an inch in diameter): Tie to the negative pole a small thin strip or filament of wood, three inches in length, and bent so as to project on each side of the negative pole, and a little beyond it towards the positive. On rotating the machine, two bright spots are seen upon the positive pole. If the positive pole be made to rotate upon its axis, the luminous spots do not rotate with it; if, however, the *negative pole*, with its filament of wood, be rotated, the spots on the *positive pole obey it*, and rotate also. The insertion of a non-conductor, such as a strip of glass, in front of the projecting wooden end, obliterates the luminous spot on the positive pole. When the author first discovered this, he, seeing apparently pieces of dirt on the positive pole, wiped it clean with a silk handkerchief, but there they remained in spite of all wiping; he then examined the negative pole, and discovered a minute speck of dirt, corresponding to the luminous spots on the positive pole.

When the filament of wood is removed from the negative pole, there is sometimes a luminosity or glow over a large portion of the surface of the positive ball. If in this state three or four little pieces of wax, or even a drop or two of water, be placed upon the negative pole, corresponding non-luminous spots will be found upon the positive pole, which rotate with the former, but do not with the latter.

It is, therefore, evident that there are lines of force existing between the two poles, and by these means one is able to telegraph *from* the negative *to* the positive pole to a distance of eight inches through the air, without any other conductor than that which the electrical machine has constructed for itself across the non-conducting gas.

The foregoing seems to the author to give a possible explanation of "ball-lightning;" if it be possible for there to be a negatively electrified cloud sufficiently charged to produce a flash from the earth to the cloud, a point in the cloud would correspond to the wood projection on the negative conductor; if such a cloud exist, a luminous spot would be seen moving about the surface of the earth, corresponding to the moving point of cloud over it, and thus present phenomena similar to those described by the privileged few who have witnessed this extraordinary natural phenomenon.

The author has been informed more than once by captains of vessels, that when men have been struck by lightning, a slight burn has been left upon the skin of the same shape as the object from which the discharges flew. In one instance he was informed that some brass numbers, attached to the rigging from which the discharge passed to the sailor, were imprinted upon his skin.

It is now seen that this is perfectly possible if the discharge be a negative one, that is, if the man be + to the brass number.

◆

COURTESY.

Buffalo, N. Y., April, 1871.

To the Editor of the Journal of the Telegraph:

No one will deny that a receiving clerk in a telegraph office has to undergo many trials of patience and temper quite uncommon to other pursuits; and yet it has seemed to me that, in many instances, disagreeable controversies can be easily avoided, and satisfaction given, where otherwise, blame has been attached to the Company for neglect and delay.

I speak of times when parties, who seem to forget that it requires some *little* time, at least, to transmit their business, and who, in their anxiety and hurry to get replies, have so often asked, "*Why* can't you get an answer to my despatch?" The question often iterated, becomes a source of irritation, and the man is sometimes told that "he will get the answer when it comes."

Now, I say, all this is useless, productive of mischief, and may be avoided, perhaps, not in all cases, but in a majority, by a little care on the part of the clerk in explaining the possible causes of delay in either the message sent or its reply. The party to whom the message was sent may be out of town. He may want to make inquiries himself (often the case), before replying, and so on. I have tried this plan, and know it to be of great service. The clerk may urge, in his behalf, "We have no time for such courtesy to impatient men; we have something else to do." *No time to be polite*, to be gentlemanly and courteous! My friend, your time could not be more profitably spent—profitable both to yourself and to your employers. Try it, and I am sure your trials will be lighter and less, and there will be less telegraphing by the "other line."

I recollect an incident of this nature, which occurred several years ago, and the impression made upon me at the time has clung to me ever since.

A lady, having lost her baggage, telegraphed to the station-master at the place from whence she came, to know on what train, and to what point her trunks were checked. This lady—as it afterwards transpired—had considerable money and other valuables in one of the missing trunks. Her anxiety, therefore, was by no means uncalled for, and she made numerous enquiries as to when she might expect the answer, but the clerk, worried by the constant questioning, sharply answered: "I don't know." Her eyes, filling with tears, the lady said: "Excuse me, sir, for troubling you." It is written, "A soft answer turneth away wrath." It did in this case, for, as if ashamed of his unmanliness, our clerk, in pleasanter tones, remarked, "Perhaps the agent is not to be found; I will inquire." He did enquire. The agent had been absent, was then writing the answer, which, when delivered to the lady, drew forth her hearty thanks, and, I am sure, the clerk felt the better for having chosen the better part. In fact, I *know* he did, for he told *me* so, and he now tells it to you.

X. Y. Z.

◆

Hiding the Dollar with a Dime.—Buckley, in one of his lectures, made use of an illustration that will bear repeating. Holding a dime close to his eyes with one hand, and a half dollar at some distance with the other, he said:—"Now, I cannot see the half dollar with this eye, for the dime is so near it, it obscures my vision. So it is with men of business; in their eagerness to save a dollar they often lose sight of the fifty within their reach."

HOW TO KEEP A SITUATION.

The following bit of good advice is from the *Working Man*, and is worthy the attention of all our readers: Lay it down as a foundation rule, that you will be "faithful in that which is least." Pick up the loose nails, bits of twine, clean wrapping paper, and put them in their places. Be ready to throw in an odd half hour or hour's time, when it will be an accommodation, and don't seem to make a merit of it. Do it heartily. Though not a word be said, be sure your employer will make a note of it. Make yourself indispensible to him, and he will lose many of the opposite kind before he will part with you.

Those young men who watch the time to see the very second their working hour is up—who leave, no matter what state the work may be in, at precisely the instant—who calculate the extra amount they can slight their work, and yet not get reproved—who are lavish of their employer's goods, will always be the first to receive notice that times are dull, and their services are no longer required.

◆

Bulls still prevail and show their horns. A correspondent gives the following message, which placed a citizen in very unpromising circumstances.

"Huron left twelve-thirty bound up, J. Green on a board! Query. Was Mr. Green trying speed with the Huron?"

◆

Luck and Labor.—Many people complain of their bad luck, when they ought to blame their own want of wisdom and action. Mr. Cobden, a distinguished writer in England, thus wrote about luck and labor:

Luck is everything waiting for something to turn up. Labor, with keen eyes and strong will, will turn up something.

Luck lies in bed, and wishes the postman would bring him news of a legacy.

Labor turns out at six o'clock, and with busy pen or ringing hammer, lays the foundation of competence.

Luck whines.
Labor whistles.
Luck relies on chances.
Labor, on character.
Luck slips down to indigence.
Labor strides upward to independence.

◆

The famous girdle round the world, referred to by "Puck," will actually be completed next month. The line from London to Singapore has just been completed, and will be extended to Hong Kong within the next four weeks. As London is already in telegraphic communication with San Francisco, by way of New York, it follows that after communication shall be opened between London and Hong Kong, a resident in the latter place will be able to telegraph to San Francisco with about as much rapidity as though there were a line under the Pacific ocean. The constantly increasing trade between China and our western coast will make the use of the telegraph a necessity to Hong Kong and California merchants trading with one another. There will, therefore, be an immediate increase in the business of the Western Union and Atlantic telegraph companies, and we may expect to see earnest opposition, especially from the latter, to the Pacific ocean telegraph scheme.—*N. Y. Citizen.*

◆

The employment of women in the Telegraph service, is becoming also in Hungary, to be more frequent. In the lately opened offices at Kirchdrauf, Wallendorf, Krompach and Goellnitz, women are employed. A number of girls from Leutschau and Kesmark intend taking a course of instruction at Ofen, so as to receive appointments in time.—*Ill. Staats Zeitung*, *March* 18, 1871.

RAILROAD TELEGRAPH OPERATORS.

Concerning the telegraphic operators on the line of the New York Central Railroad, a correspondent of the *Troy Times* writes:

Operators receive from $25 to $60 per month, though in large cities as high as $100 is sometimes paid. They are, in stations of minor importance, required to sell tickets, and have a small addition of pay on this account. There are many young women in service along the line, and telegraphing is becoming an attractive field for this class. The pay is light, considering the close confinement to which they are subjected, which always impairs health, and sometimes utterly destroys it. So far as this point is concerned (and its importance all may admit) I had rather be a brakeman, and take his risks of accident than to earn more money in the telegraph service. The night work is especially trying, and the habit of smoking, in order to while away the hours, increases the disadvantage. There is, as may be imagined, great difference in the capacity and skill of operators. Some are very expert at receiving and reading off messages, but are slow in sending them, while in others the case is reversed, and they excel in despatching messages, but are dull in their reception. The difficulty in the last mentioned duty is to read correctly, and as this is done chiefly by listening to the ticks of the key, great facility and precision of ear is required. On this account even a tolerably good operator should have at least three months' practice before he assumes the regular duties of a station, and after this, constant improvement should be looked for every year.—*Com. Adv.*

◆

DRINKING WHILE EATING.

Whoever, contrary to his usual custom, will turn down his glass at the beginning of a meal, and not make use of it till the close, may perceive that a great many consequences flow from so simple an action. In the first place, the only aid to mastication and deglutition, apart from the teeth and tongue, will be the saliva, of which, from long disuse, there probably will not be the desired abundance. The time occupied in disposing of a mouthful of food will thus be prolonged, and the character of the food make a greater impression on the palate. The stomach will not be treated to a cataract of half-drowned morsels, but at proper intervals to well-prepared material for digestion. There will be no haste, no bolting; the tendency to stuff and overload the stomach will be checked or fairly overcome—at least there will be no leisure to consider whether one is eating too much. It is needless to add that these changes would be in the interest of good breeding at the table, there being few things more repulsive than the sight of a person who darts at his food, gulps it down in an instant, and, before it is fairly deposited in his mouth, has caught up more with which to pursue it.

A little reflection will convince us how narrow must have been the distribution of animal life on this globe, if the habit of which I complain had been a provision of nature for elephants, buffaloes, giraffes, all the deer kind, the birds, and even the beasts of prey. The crocodile and the hippopotamus would have been enviable to all their unamphibious brethren, while the area devoid of lakes or streams would have been so deserted, that man could with difficulty have settled upon it in his savage state. As it is, the herds which roam the trackless wilds of Africa, are content to slake their thirst at the close of the day, after a wandering of many miles away from the fountain, and a tedious return to its life-giving waters. Their enemy, the hunter, is formidable according to his powers of endurance against thirst in the desert.—*Herald of Health.*

SPEED OF TELEGRAPH INSTRUMENTS.

The Queen's speech was transmitted on the 9th inst, by postal telegraph to nearly 200 towns in the United Kingdom. The speech contained 1,780 words—that is more than double the number of words contained in the speech of 1870. The transmission began immediately after the commencement of the delivery of the speech, at 2:19 P.M. Opportunity was taken to test the powers of the various instruments employed by the Post Office for the transmission of messages. For the transmission to Brighton, Southampton, Portsmouth, and some other towns, the Morse printing instrument was employed. The transmission to Brighton was completed in 43½ minutes, the transmission to Southampton in 45 minutes. The operators in these two cases were women; and it is believed that the speed which they attained of over 40 words per minute is the greatest that has ever been obtained for an equal length of time on the Morse printer. As an experiment, the speech was transmitted to Liverpool by the Hughes type printing instrument, which prints its messages in ordinary Roman type. The speed attained, was between 36 and 37 words per minute; and, as in working this instrument abbreviations are not used, the speed may be considered fully equal, if not superior, to the Morse, on which abbreviations are used. For the transmission to all the principal towns in the country, the Wheatstone automatic transmitter was employed. The speech, as transmitted by telegraph, was sold in Newcastle and Edinburgh at 3:45, in Dublin at 3:47, in Glasgow at 3:50, in Cork at 4, in Jersey, with two transmissons, at 4; at Darlington, with two transmissions, at two minutes past 4; in Dundee, with two transmissions, at 4:20; in Belfast, with two transmissions, at 4:28; in Inverness, with two transmissions, at 4:40; and in the Isle of Man, with two transmissions, at 5 P. M.—*English paper.*

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AN EXHORTATION TO COURTESY.

To the Editor of the Journal of the Telegraph.

Observing your liberality in regard to publishing the correspondence of the craft, and your out-spoken views respecting Christianity, I would be glad to be permitted to speak a word in favor of Christian courtesy among operators. Having labored in the business for ten years, and knowing that the position of an operator is one in which will be found many things to try the temper, much allowance is to be made. The operator, acting on genuine Christian principle and carrying out its law of kindness and courtesy, is not only securing his own benefit here and hereafter, but that of his employers and the business entrusted to him. This may often be noticed upon the resignation or change of Operators. When the appointment of a successor is made, the business of the office will, sometimes, very materially and rapidly increase. This can be accounted for in no other way than the more obliging and polite bearing of the new incumbent and the earnest endeavor to serve the interests of the people. He strives to bring his religion into his business, and, by following the great example set him, is always sure of giving satisfaction to his employers and noticed and honored by the community in which he is located. Therefore may I say to my brother Operators, always be polite, obliging and courteous to your fellows on the wire, and to those who frequent your office. Give soft answers for harsh words. Let them have the circuit if they want it, and you will be the gainer in the end. Above all, be sober, industrious and Christ-like.

Your brother, K.
Bloomfield, N. J.

◆

A Parisian has sued the journal he subscribes to for damages, because it is badly printed, on paper of an inferior quality, is full of misprints, and is not punctually delivered.

THE TELEGRAPH.

Since April 1st, the telegraphs of the Erie Railway and its branches have been controlled by the Western Union Company. One of the results of this change has been, a considerable reduction of tolls to sixty telegraph stations; for where as heretofore it has cost the public two "local rates," it will now cost only the graduated or "distance" scale to communicate with these points.

To illustrate: the rate to Elmira has been, first the local rate to Buffalo, 65c., then the Erie Co.'s rate from Buffalo to Elmira, 50c. Now the rate will be 75c. for the entire distance.

The rate to Binghamton will fall from $1.15 to 90c., and the rate to Paterson, N. J., from $1.40 to $1.00. —*Titusville, Pa., Journal.*

◆

Except in the case of Mr. Tweed, it has not been customary to propose the building of monuments to living men. But when a great public benefactor like Prof. Morse, the inventor of the electric telegraph, reaches his eightieth year, he may be considered so far removed beyond the competitions, rivalries, and jealousies which crowd the formative period of all great reputations, as to be the fit recipient of favors which are usually deferred till after death. Moreover, as he has lived long enough to see the wonderful spread of his invention round the whole earth—witnessing in the scientific world such a triumph of his labors as Mr. Garrison in like manner has lived to enjoy in the moral—the apparent impropriety of building either of these two men's monuments before digging their graves is almost wholly removed.

A few days ago we saw the venerable inventor. Few octogenarians are better preserved. His patriarchal beard—like Merlin's—is his chief sign of age. Everything else about him—his twinkling eye, his sly humor, his vivacious talk, his steady hand, his elastic step—all indicate a man who might readily pass for ten or a dozen years younger. And yet, on the other hand, it must be honestly confessed that his manners, his spectacles, his red silk handkerchief, and his dreadfully bad politics are the peculiar signs of a gentleman of the old rather than of the new school.

A substantial testimony was given to Prof. Morse in Europe in 1858 by the combined action of ten European governments, on the motion of France; taking the comfortable form of 400,000 francs—enough to make rich a much poorer man than the recipient was at the time he received it. But even before this the Sultan of Turkey (who, more than any other sovereign, would naturally sympathize with the Professor's antique politics) sent him the most gorgeous of decorations—being a circlet of diamonds, accompanied by an address of the most passionate oriental eloquence. The aged Professor has a tin box, lined with satin and wool, in which—like eggs in a bird's nest—he keeps his unchristian ornament, together with the Cross of the Legion of Honor from Louis Napoleon (who has ceased to confer such), a scientific gold medal of Wurtemberg, a gold snuff-box from the former King of Prussia, a cross of the Knight Commander of the Order of Isabella the Catholic (who now receives less honor than she heretofore bestowed), and similar signs of the favor of kings and princess of other European countries, including the Pope.—*Theo. Tilton, in the Golden Age.*

◆

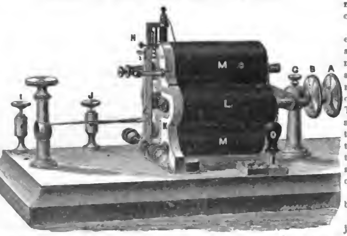
The importance of the abatement by the Western Union Telegraph Company of the additional charge of 10 cents on all messages to and from the portion of the city lying between Canal and Fifty-ninth-sts, may be inferred from the fact that the concession will cost the Company on the present volume of business, $4,500 per month, or about $50,000 per annum.

ELECTRIC QUANTITY AND ELECTRIC INTENSITY.

The following is an extract from a recent lecture by Prof. Tyndall, at the Royal Institution: "Faraday immersed two wires, the one of zinc and the other of platinum, each one one-thirteenth of an inch in diameter, in a cell of accidulated water. The depth of immersion was only five-eighths of an inch, and the time of immersion only three-twentieths of a second. Still he found that the electricity generated by this small apparatus in this brief time produced a distinctly greater effect upon a magnetic needle than twenty-eight turns of the large electric machine of the Royal Institution. A cubic inch of air, if compressed with sufficient power, may be able to rupture a very rigid envelope; while a cubic yard of air, if not so compressed, may exert but a feeble pressure upon the surfaces which bound it. Now the electricity of the machine is in a condition analogous to the compressed air. Its density, or, as it is sometimes called, its intensity, or tension, is great. The electricity from the voltaic battery, on the other hand, resembles the uncompressed air. It exceeds enormously in *quantity* that from the machine; but it falls enormously below it in intensity .The deflection of a magnetic needle and other actions of the voltaic current depend solely upon quantity, hence the vast superiority of the voltaic current in producing such deflection. Faraday found the quantity of electricity disengaged by the decomposition of a single grain of water in a voltaic cell to be equal to that liberated in 800,000 discharges of the great Leyden battery of the Royal Institution. This, if concentrated in a single discharge, would be equal to a great flash of lightning. He also estimated the quantity of electricity liberated by the chemical action of a single grain of water on four grains of zinc to be equal in quantity to that of a powerful thunder-storm. Weber and Kohlrausch have found that the quantity of electricity associated with one milligramme of hydrogen in water, if diffused over a cloud 1,000 metres above the earth, would exert upon an equal quantity of the opposite electricity at the earth's surface an attractive force of 1,268,000 kilogrammes."

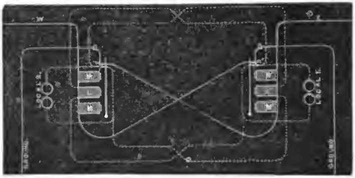
Queensland Telegraphy.—The establishment of telegraphic communication in various parts of Queensland continues to make good progress. Communication over the Burdekin river has been made more secure. The span from bank to bank is nearly half a mile; a light wire strand has been substituted for the ordinary wire at this place, and, as an additional precaution, a submarine cable has been buried across the bed of the river. This cable can be made available for communication in the event of an accident to the wire strand. A station has been opened at Waterview. A line in course of construction from Cardwell to Normanton has been rapidly progressing; the first section of fifty miles was completed and opened in the course of January. The country between Cashmere and the Etheridge has been explored by Mr. Macmillan, who reports favorably upon it. The outer section from Normanton to the Etheridge is advancing rapidly, the line having been cleared for a distance of 150 miles The Queensland Legislature has voted grants for the construction of a line from Allor *via* Leyburn to Goondiwindi, 150 miles, as well as for a line from Clermont to Springsure, 110 miles. —*Engineering*.

GRAY'S SHUNT REPEATER.



The above cut represents one half of one of these repeaters. M M is a magnet in the main circuit; L is a magnet in a local circuit, both acting on the same armature. A is an adjusting screw for the main magnet, B for the local, each adjustment being independent of the other. G is a set screw to hold B in place when A is turned. The armature lever C is made of ivory and provided with two platinum points l and m. The latter strikes upon the spring point F, and breaks and closes the main circuit, while the point l strikes a solid point in the brass frame, and shunts the local magnet on the receiving side. H is a set screw to adjust the spring F.

The following diagram shows the arrangement of connections. The main circuits W and E pass respectively through the magnets M M and M¹ M¹, and through the repeating points m¹ and m. When both armatures are closed, the local currents run on short circuits through the points l¹ and l respectively; but when the armatures are open, the current of Local No. 1 passes through magnet L, and that of Local No. 2 through magnet L¹.



The operation of the repeater is as follows: Suppose both armatures closed, the main relay magnets will be charged while the local magnets will be shunted at l and l¹, and consequently neutral. If the main circuit E be broken, the magnet M¹ M¹ will release its armature and break the main circuit W at m¹; but at the same time it will open the point l¹ and compel the current of local No. 1 to pass through the magnet L holding the armature on that side closed. If the circuit E be now closed, W will be closed at m¹. The same motion of the armature will shunt L at l¹; the magnet L will not discharge until the magnet M M is fully charged.

The momentary retention of magnetism in magnet L after contact has been made at l¹ is owing to the extra or induced current, which, having a closed circuit to traverse, prolongs the magnetism a moment longer than if the circuit were broken.

This is easily illustrated with a Sounder. Close a circuit through it; connect a short wire to one binding post, and make and break contact with the wire and the other binding post. When the magnet is thus cut out, the sounder will open, but not as promptly as by a break. The difference is plainly distinguishable. The shunting of the local magnet thus gives the main magnet plenty of time to charge before the local releases the armature. The local magnets are also quicker in charging than if the circuit was opened and closed.

The advantages of this repeater may be summed up as follows:

1. It is impossible, with proper adjustment, for false breaks to occur.

2. The repeating is done with the relay armature, thus saving the time of one armature motion, at each repeating station. Ten repeaters in a line, that repeat through relays, will lose no more time than five that repeat through sounders.

3. The adjustment is the same as that of an ordinary relay.

4. The armature may be worked on as short a stroke, and in a bad line as well as that of an ordinary relay.

5. It can be used as two relays, by simply changing the two plugs.

6. It requires no extra locals; but when sounders are used, they strike as clear as though worked by relays.

DIRECTIONS FOR SETTING UP AND ADJUSTING.

Connect the main lines to the binding posts at the heel of the respective relays and the local wires to the other binding posts. The spring F should be adjusted to such a position that the two points shall strike as nearly as possible at the same time. The spring point has a little lead, but the less the better.

Rule for Adjusting.—When the sending side breaks itself, adjust the local coils, on the receiving side, nearer to the armature.

When breaks do not go through promptly, adjust the local coils, on the receiving side, further away from the armature.

A still greater tendency to break may be given, by adjusting the main coils nearer to the armature, and tightening the spring.

There are two points in the adjustment of a repeater that must be avoided, viz.: the point where it breaks too easily, and the point where it breaks too tardily. In this repeater, the proper medium between the two is readily attained and maintained under all circumstances.

Connect sounders in the two local circuits, the same as for two relays.

When repeating, the plugs should be in the holes R R; changing the plugs to the other holes will separate the two lines.

These repeaters are manufactured by Gray & Barton, 479 State street, Chicago, Ill., and the workmanship on them is of the highest order.

Persian Telegraphy.—The Persian Government has started a new telegraph wire between Tabreez and Khoi, running upon the Indo-European Company's posts as far as Marand.—*Engineering*.

THE SERVICE.

WESTERN UNION TELEGRAPH COMPANY.

APPOINTMENTS.

Miss Kate Hickey		145 Broadway, N. Y.
W. S. Langdon		Manhattanville, N. Y.
Miss Lizzie M. Noble		145 Broadway, N. Y.
John E. Russell	manager	Bradford, N. H.
C. N. Dutton	manager	Brandon, Vt.
E. G. Mason	operator	Rutland, Vt.
W. H. Annis	manager	W. Boylston, Mass.
W. C. Coffin	operator	S. Braintree, Mass.
C. C. Abbott	operator	Holliston, Mass.
F. A. Eastman	operator	Boston, Mass.
Wm. Lombard	operator	Terryville, Conn.
Drury & Rice	operator	Milford, Mass.
Frank Sammis	operator	So. Norwalk, Conn.
Miss Annie Sherman	operator	Foxboro, Mass.
Miss F. M. Porter	operator	Fort Washington, N. Y.
Ira S. Kinch	operator	Farmer Village, N. Y.
H. F. Peet	operator	Clyde, N. Y.
Miss Anne A. Richards	operator	Skaneateles, N. Y.
B. T. Strickland	operator	Chenango Falls, N. Y.
A. W. Bowman	operator	Hackettstown, N. J.
Theo. F. King	operator	Washington, D. C.
Chas. A. Laubach	operator	Washington, D. C.
D. Marsau	operator	Washington, D. C.
A. C. Ritchie	operator	Manchester, N. J.
Sam. B. Roberts	operator	Washington, D. C.
W. E. Shannon	operator	Scranton, Pa.
S. B. Wilson	operator	Pemberton, N. J.

TRANSFERS.

H. H. Atwater	145 B'way, N. Y., to Appleton's, W'msburg
Chas. E. Gatter	Fulton Market to Corn Exchange, N. Y.
C. H. Smith	Manhattanville to Spuyten Duyvil, N. Y.
Z. Gibbs	Taunton, Mass., to So. Windham, Conn.

RESIGNATIONS.

Miss S. E. Cornwall	145 Broadway, N. Y.
T. C. Douglass	Hunter's Point, L. I.
A. Flowers	145 Broadway, N. Y.
James McDonald	Eighth Avenue, N. Y.
J. W. Copeland	Brandon, Vt.
F. H. Allen	West Boylston, Mass.
G. Benedict	So. Norwalk, Conn.
D. Harmon, Jr	Boston, Mass.
C. A. Mott	Milford, Mass.
Miss E. J. Spencer	Westbrook, Conn.
Miss B. A. Thompson	Holliston, Mass.
J. E. Wright	Boston, Mass.
P. N. McAuley	Fort Washington, N. Y.
H. B. Hill	Farmer Village, N. Y.
E. R. Rindge	Chenango Falls, N. Y.
R. B. Sweet	Clyde, N. Y.
Miss Julia H. Tyler	Skaneateles, N. Y.
John McCarty	Scranton, Pa.
James F. Morrison	Washington, D. C.
W. J. Ramsey	Manchester, N. J.
J. H. Reeves	Pemberton, N. J.
W. A. Schenck	Hackettstown, N. J.

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Correspondents who have written us in reference to the crowded condition of their tariff books, are informed that a supplemental tariff book is being prepared, embracing all offices opened since the printing of the first volume and which will be issued as soon as possible.

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Singular Telegraphic Achievement.—Within a week or two a singular telegraphic achievement is said to have occurred. A gentleman suddenly became ill of pneumonia, in Washington. His physician, a gentleman of great attainments and fame, resided in New York, and he was anxious that this physician should be consulted about his case. A telegraph wire was by his direction taken into his room, and the New York doctor being summoned to the telegraph office there, the Washington physician attending the patient informed him of the state of the case, and even enabled him to feel his patient's pulse by causing the wire to vibrate as the pulse did. The case thus being thoroughly diagnosed in New York, the necessary prescriptions were sent thence to Washington. The attack, though violent, soon yielded to the treatment, and the patient is now a very cheerful convalescent.—*Exchange.*

HOW A FAITHFUL MAN WORKS.

New Orleans, March 29, 1871.

To the Editor of the Journal of the Telegraph:

Dear Sir: The following message was received this morning by Mr. Flancry from one of his boys, who does duty among the alligators in the pine woods and swamps between here and Mobile. I think Mr. Yelverton is entitled to the "silver spurs" or climbers for his most extraordinary performance in telegraph repairing:

Americus, Miss., March 29th.

Went West on 27th; removed thirteen trees from lines, twelve crosses, and mended four breaks, replaced twenty-two old brackets and seventy-three insulators between here and the six-mile post; also put on two new brackets and two new insulators. On the 28th removed eighteen trees, twenty-one crosses, mended five breaks, and put in three hundred and twenty yards of wire taken out by some men rafting; replaced forty-seven old brackets and seventy-one old insulators; also put on twenty new brackets and twenty new insulators between the sixth and eleventh mile post west end of section. I got section up clear and in working order, and have got to back and put up one pole and a few more brackets, but have been wading and swimming in water two days, and am now down with rheumatism, so that I can't climb, but will go soon as I can.

We had a very heavy wind storm Sunday A. M. I should think it was a heavy storm. It was sharp, quick and destructive, lasting scarcely fifteen minutes, but prostrated the wires in every direction in this neighborhood.

P. Delgado, of Brickley, the next station to Americus, took thirty trees off the wires on the 27th, besides doing other work, completing an excessive day's labor.

The brothers Davidson, of Gainsville and Wolf River stations, also had their share of hard work after the big blow.

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Allusion has been made occasionally to the facility with which very young persons acquire the ability to telegraph. We have come to the knowledge of another young candidate for telegraphic honors.

Mr. W. G. Brownson, of Wellsville, Ohio, has a young son, now at school, aged twelve. When six and a half years old, he learned to manipulate the key, and could send a message readily at seven. From seven until eight he was out of practice and at school, when he again took it up, and received readily and well by sound before he was nine years old. At eleven he had charge of the office at Industry, Pa., and learned the lady who is now in charge there. He is now twelve and at school, but occasionally goes in harness, earning sixty dollars per month.

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ON THE ALCOHOLIC COMPOUND TERMED PUNCH.

By Snug the Joiner.

Experiment has proved that the juice of three or four lemons, and three-quarters of a pound of loaf-sugar dissolved in about three pints of boiling water, give saporous waves which strike the palate at such intervals that the thrilling acidity of the lemon-juice and the cloying sweetness of the sugar are no longer distinguishable. We have, in fact, a harmony of saporific notes. The pitch, however, is too low, and and to heighten it, we infuse in the boiling water the fragrant yellow rind of one lemon. Here we might pause, if the soul of man craved no higher result than lemonade. But to obtain the culminating saporosity of punch, we must dash into the bowl, at least a pint of rum and nearly the same volume of brandy. The molecules of alcohol, sugar, and citric acid collide, and an entirely new series of vibrations are produced—tremors to which the dullest palate is attuned.

In Punch, then, we have rhythm within rhythm, and all that philosophy can do is to take kindly to its subtle harmonies. It will depend in some measure upon previous habits, whether the punch when mixed will be taken in excess or in moderation. It may become a dangerous ally of gravity and bring a sentient being to the gutter.

BOLTON'S TELEGRAPH CODE.

Contrary to our expectation, a large edition of this work was sold before publication in England, and is now to be published in New York, a number of copies having, it is said, been already subscribed for. It is to be sold exclusively by subscription or of the publishers, and is patented in England, America, France, Italy, Belgium, India, and Newfoundland.

We can give a better idea of the work from the circular of the publishers than by any description of our own:

A message can be expressed either by words, letters or figures, at the option of the sender. Example:

"The arrangements are completed. We intend going by the next Cunard steamer. Petroleum in good demand, at about previous rates; no fears entertained of a further decline."

This message consists of 27 words; when Coded, it is expressed by 5 words (i. e., by "Word Code"), thus—Barry Interludes Pebble Pushing Diagonally—or by 5 groups of 4 letters each (i. e., by "Letter Code"), thus—*BXPR JOHG LOZL MKOF FQGB*—or 5 groups of 5 figures each (i. e., by "Figure Code"), thus—07438 53904 69188 74896 28860.

For transposing it into Secret Cypher that shall be absolutely unintelligible to a third party, it is sufficient that a previous arrangement be made to read so many numbers backwards or forwards, say, for instance, 112 plus, i. e., the Code word, letters or figures, 112 lines forward. This key (112) being known only to the sender and receiver, the message would be as secret as a sealed letter.

Sanctioned for public use over all the telegraph lines of Great Britain by the Postmaster-General, and adopted and used by the English Army and Navy, and by mercantile men generally.

The economy to be effected by the use of this Code will be seen by the following certificate:

"We have witnessed several trials of Bolton's system of coding messages."

"These have been transmitted through the Atlantic Cable, first by the Morse Alphabet in full, and then codified."

"The messages have been correctly transmitted, and the time occupied in doing so through the Cable has shown a saving in favor of Bolton's Code, for messages of ordinary character, varying from 50 to 400 per cent., according to the nature of the message."

(Signed) C. F. Varley.
Cyrus W. Field.
William Thomson.

The Code is a large quarto of over 1,100 pages, strongly bound. Price, $40. Publishers, Felt & Co., New York.

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SMALL ENGAGEMENT.

How much the brightness of Christian honor is dimmed by inattention to "trifles," has by contrast an illustration in the following bit of history:

Sir William Napier was one day taking a long walk near Freshford, when he met a little girl about five years old sobbing over a broken bowl. She had fallen while bringing it from the field to which she had taken her father's dinner in it, and she said she would be beaten for having broken it; then, with a sudden gleam of hope, she innocently looked into his face, and said, "But ye can mend it, can't ye?" Sir William explained that he could not mend the bowl, but the trouble he could mend by the gift of a sixpence to buy another.

However, on opening his purse, it was empty of silver coin, and he had to make amends to meet his little friend the same hour the next day, and to bring the sixpence with him, bidding her, meanwhile, tell her mother she had seen a gentleman who would bring her the money for the bowl the next day. The child, entirely trusting him, went on her way comforted. On his return home, he found an invitation awaiting him to dine in Bath, the following evening, to meet some one whom he especially wished to see. He hesitated for some little time, trying to calculate the possibility of giving the meeting to his little friend of broken bowl, and of still being in time for the dinner party in Bath; but, finding that this could not be, he wrote to decline accepting the invitation, on the plea of a "pre-engagement," saying to one of his family as he did so, "I can not disappoint her, she trusted me so implicitly."

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—
JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, APRIL 15, 1871.

WESTERN UNION STOCK.

Some men suppose an editor to be a diviner, inside the horoscope of whose hairless head the past, present, and future sit down daily and dine and wine with each other. Judging from letters which reach us now and then, we seem suspected of possessing some of this occult power. Here, for example, is a note from a distinguished jurist, as brave in his decisions as he is true of heart, who asks: "How high is W. U. stock to rise before it is knocked down?" The question must have been asked in sport. It is not very polite. To this good gentleman, however, and many lesser men, we use this presumptuous query to point an answer, based on no secret knowledge or eavesdropping at the executive door, but such as we believe the facts should reveal to any intelligent observer.

THE PAST.

It was, in years past, a common charge that much of the lines of the Western Union Telegraph Co. were mean and wretchedly constructed, and bore no proper relation, even in their extent, to the capital. This was once partially true. We need not now relate why or how or to what extent. But it gave a convenient text to every growler, encouraged opposition, and sharpened congressional wit. This character of unreal value was somehow so harnessed to the name ot Western Union, and so exaggerated, that conversation respecting it sounded, to a stranger's ears, as if the elements of the human organism were being itemized, and "water 72 parts" stated as a constituent element of the formulæ. There was, indeed, somewhat of a mackerel look about its sky. The public market also accepted the general diagnosis, and, indeed, clung to it long after it ceased to have any truth. For two years past the market has not reached the expression of the stock's intrinsic value, except spasmodically.

PROGRESS.

During the last four years there has been a clear, persistent policy, looking to solidity of property on the one hand, and the wiping away of all obstructions to direct and rapid transmission between great commercial centres on the other. In accomplishing the former, thousands of miles of line have been swept away and rebuilt. In that period nearly 40,000 miles of new wire have been strung, and more than half of the whole structure substantially renewed. Nor have the wants of the hitherto unreached portions of the country been forgotten. The simple fact that about 1,500 new offices have been opened since the close of 1866, and the whole vast ruined lines of the South made practically new, is proof of the energy with which the wants of civilization have been met. Indeed it was early seen that in this direction lay the future power and dominance of the Company.

REDUCTION OF THE TARIFF.

Nor was this all. In spite of the seeming necessity of maintaining measurably the high tariff inaugurated by the war to carry out these extensive operations, charges were so reduced that a general panic swept over the lines, upon the fear that the incomes of employes must proportionately suffer. The published receipts, with their sad diminishment, were scanned and wept over. The cry was raised: "All this is not a policy of strength, but simply to starve the enemy." The policy was, indeed, bold, sweeping, fearless. And when orders went out to accept messages at half rates after 5 P. M., we confess to a personal fear that "madness ruled the hour." Yet no policy was ever more markedly successful. This was not proved in an immediate harvest, but it so opened up the possibility of lengthened and cheap communication as to stop the natural hatred to an immense corporation, by meeting popular necessities by a larger and more liberal hand than its most rabid haters thought of demanding.

These were the acts on which a live executive calculated on a wider acceptance of telegraphic facilities, and an ultimate enlargement of the value of the Company's capital. We presume it was to so force attention from mere current accomplishments, and direct it to the wider significance of the rapidly enlarging field and vision of the Company's work that the monthly publication of the receipts was withheld. We publish to-day an order directing the field of the half-rate system to be extended to the longitude of Omaha, embracing all of Texas, Arkansas, and the railroads leading South from Lawrence, Kansas. This part of the executive policy is gradually leading to the utilization of many of the hours of each day hitherto unemployed, enlarging transmission thereby, without the necessity of a large and costly multiplication of wires.

THE PRESENT.

The actual extent of the entire system of telegraph lines in the United States, January 1, 1871, was as follows:

TOTAL TELEGRAPHS IN THE UNITED STATES.

Miles of line	73,271
Miles of wire	160,843
Number of offices	5,914

WESTERN UNION LINES AND TRIBUTARIES.

Miles of line	62,996
Miles of wire	127,142
Number of offices	5,065

OTHER LINES IN OPPOSITION.

Miles of line	10,275
Miles of wire	27,701
Number of offices	867

The contrast in extent of territory and property between the W. Union lines and others must hereafter greatly and necessarily increase.

THE FUTURE.

The active work of 1871 has now fairly began. A new large wire, No. 6, is being erected between New York and Chicago, on which may be used the Printing instrument, with its greater capacity for speed. New wires are also being erected between New York, St. Louis, New Orleans and other cities. A new line of three wires is being finished on the Mobile and Chattanooga Railroad, between New Orleans and Mobile. The same road is being extended rapidly west of the Mississippi, on which a new line will be constructed, and to which the present line through the swamps of Louisiana will be removed. A line from Indianola via Corpus Christi to Brownsville, has been ordered, and will be completed this summer. It will connect with the Mexican Government lines from the City of Mexico to Matamoras, and thus bring all parts of the United States, and indeed of the commercial world, in direct telegraphic connection with the principal cities of Mexico. A contract has just been executed with the International Railway of Texas for a line along that railway, which will extend from the north-east corner of Texas to Laredo on the Rio Grande. Another is about being concluded with the Great Northern Railway of Texas, running north from Houston to meet the road now in process of construction south through the Indian territory. The line on the new railway, Little Rock to Fort Smith, will be completed within a few weeks. Heretofore, the telegraph system in Texas has had but one outlet—that by way of the line through Louisiana to New Orleans. By the completion of the lines above-named, Texas will have three additional connections: one via Marshall and Shreveport to Vicksburg; another, Fulton and Little Rock to St. Louis or Memphis; and the third north, via Fort Scott or Kansas City. On the Pacific coast telegraphic extension is progressing steadily. The lines south of San Francisco now reach San Diego, with branches connecting several new points on the coast. A contract has just been concluded with the California and Oregon Railroad Company, whose road is now in process of construction between San Francisco and Portland, by which the present line extending to Oregon, Washington territory, and British Columbia, will be transferred to the railroad as fast as completed, and an additional wire will be erected, to provide for the rapidly increasing business of that section. Other lines, some of them important, are projected, and will probably be commenced during the year. The present indications are that more lines will be constructed by the Western Union Company and its tributaries during the current year than the total of all those now being operated as competing lines.

What does all this mean? It seems very clear, yet may need to be told. The Company's property is becoming every month *a closer representative of its capital.* Here is where the gradual appreciation of Western Union stock has its true significance and cause. It is a simple recognition of its legitimately increasing value, based upon actual enlargement of property, and the broader basis which is being supplied for the vast increase of business the future is so certain to bring. At least such is our thought, as we calmly watch the operation of a policy which is like the casting of seed for a distant harvest, but with a mathematical assurance of result, such as wheat sowing or corn planting less certainly give. It should not be many years, under present processes, before the capital, large as it is, shall fairly represent the property, and the stock be valued at its face. We believe that day will come, if a like vigor direct the future and there be patience to await its results.

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THE TWENTY-FOURTH OF MAY.

Twenty-seven years ago, May 24th, Miss Ellsworth sent that message over the first wires erected on the American continent, which, in its laconic grandeur, gave token of what it signified to the world, and properly and devoutly recognized the source of the latest and best gift of science to mankind. It was the first message which woke the slumbering spirit of the silent wire to a knowledge of its powers and to its new and grander uses. We have occasion to know that although, in the moment of its passage, the inventor of the machinery by which the electric current first made an intelligent record to the human eye, with a joy which he would have been less than man not to feel, greeted gladly the first words of the child his brain had born, yet that then as now he claims to have been only the instrument of the Almighty in the delivery of the great gift of the century to his race. So the message may be read to-day, in the light of these wondrous intervening years, with a devouter recognition of where gratitude is due; and while the mechanism may bear the name of Morse, the mind of thoughtful men, looking beyond the inventor's mediate work, exclaims with deepening recognition: "What hath God wrought!"

Those who have seen the plaster cast of the statue of Prof. Morse, now in the National Art Foundry in process of casting, know that it represents the Professor presenting this identical message and uttering, as his own, the exclamation it bears. It is urged that the date of the receipt of that message is the proper date of the inauguration of the statue. We acknowledge it fully. Additional men, therefore, have been put to work on the moulds, so as to have the statue ready before that time. The intelligent head of the foundry will do all he can to secure its completion. On the 1st of May it will be definitely announced whether the ceremonies of inauguration can then be performed. We hope to announce at that date that all is ready, and that on May 24th the statue of Prof. Morse will be unveiled.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
April 15, 1871.

T. all Offices on W. U. Lines:

The following changes in tariff have occurred since March 15, the date of the last tariff order.

Managers are hereby required to enter these changes into their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

96 Amelia, C. H., Virginia.
280 Bradford, Ind.
337 Clarkedale, Ill.
397 Centreville, Iowa.
85 Ellicott's City, Md. reop'd.
18 East Abington, Mass.
328 Edgewood, Ill.
66 Glen Carbon, Pa.
361 Horn Lake, Miss.
66 Heckscherville, Pa.
129 La Salle, N. Y.
340 La Grange, Tenn.
122 Mineral Point, Pa.
387 Morse, Iowa.
Point du Chene, N. B., reopened. Tariff same as heretofore.
* Port Washington, Wis.
329 Sheldon, Ill.
367 Stanwood, Iowa.
397 Unionville, Iowa.

OFFICES ON OTHER LINES.

	Tariff for Other Lines.	*Leaves this Line.*
Port Washington, Wis.	30 2	Milw'kee ck., Chicago.

OFFICES CLOSED.

West Springfield, Mass.; Whitehall, Pa.; Pryor's Sta., Ga., and Adams Basin, N. Y.

GENERAL INFORMATION.

Hereafter "half-rate" business will be taken for, and received from, all offices in Arkansas, Louisiana, and Texas.

The privilege of doing "half-rate" business has now been extended to *all* Western Union offices in the United States which are within the "system of squares." As explained in JOURNAL of March 1, 1871, "Offices having, in the column headed 'Square,' in the Tariff Book, a number showing the square in which they are situated, are within the 'system of squares.'"

"Half-rate" messages may be taken for, and received from, Brunswick, Ga., and Hot Springs, Ark. Both are Other Line offices.

Business for the following named Other Line offices may be sent *via* the route indicated below, if cheaper and more direct than the route *via* which it is at present forwarded.

Such offices as have heretofore sent and checked business for these Other Line offices to New York, Buffalo, or Binghampton, will hereafter send and check it to the office given below under "Leaves this line."

	Tariff for Other Lines.	*Leaves this Line.*
Florida, N. Y.	25 2	Goshen, N. Y.
Pine Island, N. Y.	25 2	Goshen, N. Y.
Unionville, N. Y.	25 2	Goshen, N. Y.
Milford, Pa.	25 2	Port Jarvis, N. Y.
Archbald, Pa. Barryville, N. Y. Cuddebackville, N. Y. Carbondale, Pa. Eddyville, N. Y. Ellenville, N. Y. Hawley, Pa. High Falls, N. Y. Kerhonkson, N. Y. Mongaup, N. Y. Neversink, N. Y. Olyphant, Pa. Providence, Pa. Pond Eddy, N. Y. Phillipsport, N. Y. Rosendale, N. Y. Rowlands, Pa. Waymart, Pa. Wurtsboro, N. Y.	20 2	Honesdale, Pa.
Blossburg, Pa. Erwin Centre, N. Y. Fall Brook, Pa. Lawrenceville, Mansfield, Pa. Morris Run, Pa. Somerville, Pa. Tioga, Pa.	25 2	Corning, N. Y.
Canton, Pa.	40 2	Elmira, N. Y.
Gorham, N. Y.	35 2	"
Gillette, Pa.	40 2	"
Horse Heads, N. Y.	35 2	"
Havana, N. Y.	35 2	"
Jefferson, N. Y.	35 2	"
Minnequa or Minnequa Spgs., Pa.	40 2	"
Millport, N. Y.	35 2	"
Pine Valley, N. Y.	35 2	"
Penn Yan, N. Y.	35 2	"
Ralston, Pa.	40 2	"
Starkey, N. Y.	35 2	"
Trout Run, Pa.	40 2	"
Troy, Pa.	40 2	"
Watkin, N. Y.	35 2	"
Hammondsport, N. Y.	25 2	Bath, N. Y.
Smethport, Pa.	25 2	Carrollton, N. Y.

Messages for Mittineague or West Springfield, Mass., may be sent to Springfield, Mass, from which office they will be delivered. Delivery charges, 50c.

Gardner, N. Y., heretofore given as an other line office, is in Square 46. It should be checked direct.

The name of the office heretofore known as Camden, Ill., has been changed to Milan, Ill.

Salmon Falls, Me., in Tariff Book, should read Salmon Falls, N. H.

THE CABLE BETWEEN SINGAPORE AND BATAVIA has been repaired. Messages for Java and Sumatra can now be forwarded by wire.

OFFICES HAVING "SPECIAL SHEET A."

Tariff to Glen Carbon and Heckscherville, Pa., is 15c. more than "Special rate" to Philadelphia.

WILLIAM ORTON, *President.*

◆

A WORD ABOUT TELEGRAPH FRANKS.

Referring to Executive Order No. 119 we desire to say that the object of authorizing Receiving Clerks to require the production of the book of frank stamps, was to prevent the use of the stamps in any case by parties other than those to whom the book was issued; but unless the Receiver has cause to believe that a message franked by a stamp is signed by some person other than the one to whom the frank was issued, the message should not be refused on account of the non-production of the book. *The stamp should always frank the message unless the Receiver has cause to believe it has been improperly obtained.*

◆

MORSE TESTIMONIAL FUND.

In our issue for May 1 we hope to run up the flag and announce the subscription complete. No similar undertaking was ever so general or successful.

We now invite all the dilatory brethren to come in and do their duty, not to us, but to themselves. If they don't, their children will be ashamed of them.

We are glad to say that already a number of orders have been received for the fine engraving of Prof. Morse, which we offered to send, post paid, for $1. We hope a fund will accrue from this to pay for a multitude of expenses, to which we must be exposed in connection with the inaugural ceremonies, and which, personally, we are unable to bear. In this, as in all things, the craft is showing its consideration and generosity.

As we write this, two of the granite blocks of the base are being set in their place in Central Park. The die, which weighs six tons, will be in place Monday, 17th. We ask our friends to read the article, "The Twenty-fourth of May." We are making great efforts to have the inauguration at that time.

LAKE SHORE AND MICHIGAN SOUTHERN R. R. TELEGRAPH.

Dear Sir: Enclosed please find draft for $50 50, subscribed by the employees in the telegraph department of the Lake Shore and Michigan Southern Railway towards the Morse fund.

Yours truly, C. L. Maine.

James Gamble, supt., San Francisco, Cal.	$30 00
Evening Bulletin, San Francisco, Cal.	11 00

"Don't leave me out."

Mrs. W. S. Cole, manager, Holly, N. Y.	$1 00

SECOND SUBSCRIPTION.

Lizzie C. O'Brien, manager, Easton, Pa.	$1 00
Kate M. Denny, operator, Easton, Pa.	1 00

"Are we in time."

Maggie Kane, manager, Cadiz, O.	$1 00
W. C. Whitmer, manager, Cadiz Junction, O.	1 00
Warren C. Green, operator, Griggsville, Ill.	1 00
W. H. Johnson, Shelby City, Ky.	1 00
G. B. Durant, Boyd, Ky.	1 00
William Jennings, Jr., N. Y. M. Co., N. Y.	2 00
C. C. Kennedy, Columbia, S. C.	1 00
J. A. Manley, Bulkley, Ill.	1 00
A. Venton, Mont. Tel. Co., Buffalo.	1 00
J. Ferguson, office boy, W. U. Tel., Buffalo.	1 00
J. T. Weal, Coffinville, Miss.	1 00
E. T. Stoever, Earlville, Iowa.	1 00
N. H. Bell, agent and operator K. C., So. J. & C. B. R. R., Bartlett, Iowa.	1 00
Samuel Black, Jr., aged 10 days, Calais, Me.	1 00
W. E. Galloway, R. R. agent and operator, Fair Bluff, N.C.	1 00
William H. Bauer, Mount Clare, Baltimore.	1 00
Geo. A. Kirby, Mount Clare, Baltimore.	1 00

AUGUSTA, GA.

J. A. Brenner, supt., Augusta, Ga. (2d.)	$2 00
J. M. Crowley, Augusta, Ga.	1 00
George Gustin, Augusta, Ga.	1 00
Operators, Macon, Ga.	4 00
Total	$8 00

CHARLESTON, S. C.

John D. Easterlin, Charleston S. C.	$1 00
J. W. Capers, Charleston, S. C.	1 00
G. W. Bell, Charleston, S. C.	1 00
C. V. Lamb, Charleston, S. C.	1 00
P. E. Ryan, Charleston, S. C.	1 00
Harry Toy, Charleston, S. C.	1 00
Total	$6 00

ROME, GA.

Dear Sir: The following gentlemen beg you to accept the enclosed $13, which they contribute to the Morse statue. The Pope sends his regards. Pressley has a baby—a gal!

Respectfully, B. O. Camp.

Judge T. J. Perry, ex-operator	$1 00
Will. L. Locke, ex-operator	1 00
Dr. R. J. Hempton, ex-operator	1 00
A. R. Smith, operator and agent S. R. & D. R. R.	1 00
D. S. Printup, Vice-Pres. S. R. & D. R. R.	1 00
Rome "Courier"	1 00
Rome "Commercial"	1 00
Rome "Daily"	1 00
Berrys & Co.	1 00
Cothran & Maguire, bankers	2 00
S. & S. Bones & Co.	2 00
Total	$13 00

If a few offices would imitate Rome, the *work* would be done.

In the acknowledgment of $24 from Philadelphia, April 1, two errors occurred. It was the *third* list from that city, and Mr. James L. Mingles' subscription was $5 instead of $1. The footing, however, was correct.

ILLINOIS.

We acknowledge the following from the hands of Supt. Day. K. Smith, Peoria, Ill.:

Samuel Allen, manager, Warsaw, Ill.	$1 00
M. A. Bacon, operator, Warsaw, Ill.	50
S. T. Burrell, agent, Canton, Ill.	1 00
N. S. Wright, merchant, Canton, Ill.	1 00
C. Nilson, merchant, Canton, Ill.	1 00
A. J. Whitnah, merchant, Canton, Ill.	1 00
M. J. Gearhart, merchant, Canton, Ill.	50
N. A White, hotel proprietor, Canton, Ill.	50
J. T. Sutton, agent and operator, Burnside, Ill.	50
Mrs. J. T. Sutton, Burnside, Ill.	50
Miss Leoti Sutton, Burnside, Ill.	50
S. Powers, agent and operator, Cuba, Ill.	1 00
H. L. Bacon, agent and operator, La Harpe, Ill.	50
Geo. W. Butler, agent and operator, Sciota, Ill.	1 00
Total	$10 50

CONDITION OF THE FUND.

Balance needed on statue	$150
On masonry, &c.	100
On the last item we gladly acknowledge the subscription of Charles T. & J. N. Chester, New York	$25

One pull more, and up goes the flag!

TELEGRAPHERS' MUTUAL LIFE INSURANCE.

ASSESSMENT NO. 18.

140 414 948

ASSESSMENT NO. 19.

140 414 948

ASSESSMENT No. 20.

12	84	90	118	140	211	252	322	349	374	396
414	441	619	655	701	708	801	800	842	851	859
877	926	932	940	941	948	987	1002	1026	1036	1061

◆

W. H. Harrington, for several years past division operator in charge of the Iowa division of the telegraphs of the North Western Railroad, after a few months' absence East, enters telegraphic duty again at Omaha, Neb. We see him highly spoken of by the papers of his native State.

◆

Erie, Pa., April 6, 1871.

J. D. Reid, Esq.—*Dear Sir:* At a meeting by the operators of the Erie and Pittsburgh R. R. Co.'s Telegraph, April 3d, Messrs. P. M. Bates, ex-Supt. Telegraph Erie, Pa., A. M. Coulter, operator, New Castle, Pa., were elected representatives of the E. & P. operators at the unveiling of the Morse statue in New York, and will send by their representatives a hearty shake hands to the father of the telegraph.

Yours, fraternally.

Ed. Puncke, Chief Operator.

◆

AN ACT

To Incorporate the Musical Telegraphy Company.

Sec. 1. George P. Hachenberg, D. Wilson, M. H. Chrystler, Isaac Van Schaack, Samuel Miller, J. J. Jackson, Joseph E. Libby, Alex. N. Webb, John L. Unger, Peter L. Hachenberg, Godfrey Frankenstein, and such other persons as they may associate with them, are hereby authorized to form themselves into a corporation by the name "The Musical Telegraphy Company," for the purpose of improving instrumental music by the application of the ready action of electricity to musical instruments, as the pianoforte, organ, and other key instruments, so as to enable one or more musicians to play simultaneously many instruments, when properly electrically connected; and such other means of introducing electro-music for public and private entertainments as its board of directors shall approve, with power for such purpose to take, by purchase or devise, subject, however, to all existing laws relating to devises and bequests by last wills and testaments, or otherwise, and to hold, transfer, mortgage and convey real and personal property, to the amount of one hundred thousand dollars.

FIRE-ALARM TELEGRAPH.

§ 7. No person, association, corporation, or company shall post, paint, impress, or in any way affix to any pole connected with said fire-alarm telegraph, or any box, wire, or other appliance nected therewith, any placard, sign, broadside, notice, or announcement of any kind, or cut, mutilate, alter, mar, deface, cover, obstruct, or interfere with the same in any manner whatsoever, or paint, or cause to be painted, the poles of any other telegraph, or any other poles on the line of the same, of a similar color or colors, or in imitation thereof, nor consent, allow, or be privy to any of said things being done for them or upon their behalf; and any offense against the provisions of this section shall be punished as a misdemeanor, and subject the party or parties violating the same to an additional penalty of one hundred dollars. No kite shall be flown, raised, or put up in the streets or avenues adjacent to the lines of said telegraph in the city of New York, or allowed to become entangled with the wires or apparatus of said telegraph, under a penalty of ten dollars for every such offense; and the commissioners of police and their officers are specially charged and directed to aid in the enforcement of this section.

◆

Philipsburg, N. Y., 1871.

To the Editor of the Journal of the Telegraph:

E. H. Walker, of Augusta, Ark., Ga., Ill., or Mo., (he don't say which), says, through your last issue, he has a local which has not been cleaned in a year, and looks as clean and works as good as a new battery. Now if our Western, Eastern, or Southern brother don't want too much for his recipe, I should like to purchase or should be pleased to hear some of those "hints" he speaks of, or even if he will tell us in what part of the globe he lives, may slip out and see him. I have four locals and they have to be cleaned nearly weekly, and if science has reached so high that batteries will run a year without cleaning, what can we look for next? I presume it won't be necessary to have any operators at all in a few of those years Mr. Walker speaks of.

I anxiously await his reply.

Telegraphically yours,

M. F.

◆

ANOTHER TELEGRAPHER WATCHED—BUT NOT CAUGHT NAPPING.

To the Editor of the Journal of the Telegraph:

As you "believe in these heart offerings, you will perhaps be pleased to notice the presentation of a beautiful gold hunting-cased watch and elegant chain, by the employees of the telegraph department of the Buffalo Division of the L. S. & M. S. R. R., to their much-esteemed chief, Geo. H. Snyder, of Erie, Pa., which pleasant affair came off at the Philippbaar Hotel, in Dunkirk, N. Y., Tuesday evening, March 21st. Mr. Snyder has for many years enjoyed the unlimited confidence and esteem of the officials under whom he has served, and—what must be equally gratifying to him—he stands strong in the affections of those who serve under his supervision. (You know how it is yourself.) In presenting this testimonial, the donors honored not only him but also themselves. The party numbered about twenty-five, comprising all the day-operators of the division—except three whose duties prevented their attendance—and John McNerny, repairer; also, as invited guests, Messrs. Washburn, road-master L. S. & M. S. R. R.; Benton, editor of the *Advertiser* and *Union;* and Townsend, of the W. U. Telegraph Office, Dunkirk. The preliminaries were admirably arranged by Tracy Niles, of the Dunkirk office, who is called by ye aforesaid editor, "that little concentration of business dignity." Mr. F. E. Blackney, of Buffalo, made a brief and well-worded presentation speech in a very graceful manner, and Mr. Snyder "saw" him in an equally fitting response, and "went his pile better" by inviting the company to adjourn to one of the cosy little lunch-rooms, where ensued a "feast of reason and a flow of soul"—no, that isn't it exactly; I should say a feast of oysters and a flow of coffee, tea and other palatable beverages. After an hour or more had been spent in thorough enjoyment, the evening trains arrived; good-byes were exchanged and the happy crowd were off for home.

T.

◆

BORN.

To T. W. Bangham, formerly manager Western Union Magnolia, N. C. office, April 7th, a fine girl (nine pounds). First child.

A very good beginning.

To C. D. A. Van Ham, manager Western Union Telegraph, Castle Garden, N. Y., April 4th, a son.

To W. H. Chapin, manager of Western Union Telegraph Office, Conesus, N. Y., Erie Railway, April 9th, a son.

To B. M. Damon, manager Chesaning, Mich., office, April 7th, a son. (Good sounder.) To Frank Sawyer, Adrian R. R. Ofs.; Geo. W. Dolph, manager Winamac, Ind., Ofs.; L. L. Tootill, Mich., Ofs.; and Henry Donnell, Dispatchers, Ofs., Kalamazoo, Mich. "How is that for high."

Respectfully yours, B. M. Damon.

To Samuel Black, manager, Calais, Me., March 30th, a son.

◆

MARRIED.

Latch—Croasdale—On the 2d inst., by the Rev. A. Culver, at his residence, No. 1,506 So. Third street, Philadelphia, Pa., Isaac N. Latch, of Lower Marion, Montgomery Co., Pa., to Miss Mottie W. Croasdale, manager of the Western Union Telegraph Office at Manayunk, Philada, formerly of Newtown, Bucks Co., Pa.

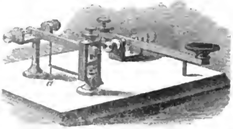
Berryman—Brown—At Corry, Pa., on March 29th, by the Rev. J. T. Protheroe, Rector of Emmanuel Church, Mr. Jno. Berryman, Jr., manager W. U. Telegraph Office, Tidioute, Pa., and Miss Nellie Brown, of same place.

Faxon—Tanner—At Forrester, Mich., January 8th, 1871, by Rev. H. Hood, John T. Faxon, operator on River and Lake Shore line, Detroit, to Port Austin, to Miss Franc J. Tanner, of Lee, Mass.

Connick—Trainer—In Spring, Pa., March 30, by Rev. J. R. Spencer, assisted by Rev. C. W. Foulk, Mr. Geo. H. Connick, manager Western Union Telegraph Office, to Miss Mina M. Trainer, all of Spring.

MECHANICAL TELEGRAPH INSTRUMENT,

PATENTED MAY 31st, 1870.



For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

This instrument is an outgrowth of this pressing demand. The Inventor is himself a practical operator, now in active service. Operators and others wishing to teach or learn the Art, will be delighted with this instrument.

It can be placed anywhere, as it does not occupy a space more than six inches square. A card with the Telegraph Alphabet, Numerals, &c., attached to each Instrument.

Its cost is but $7, and there is no expense whatever to keep it constantly in working order

Any person selling ten or more of the instruments, will be allowed ten per cent. commission, sent C. O. D., or on receipt of price.

To save expense of returning funds by express, remittances can be made by draft on Cleveland or Pittsburgh, or by Post Office Order, in which case no charge will be made for box. Price $7. Silver-plated, extra finish, $10.

Parties ordering instruments, except from well-known cities, will please give name of county and State.

Address, **D. W. PUTT & CO.,**
Wellsville, O.

D. W. PUTT,
P. BRUNER,
W. G. BROWNSON.

ATTENTION OPERATORS!

PAT. APPLIED FOR.

We would call your attention to our

TELEGRAPH OPERATORS' BADGE PIN.

Having completed our arrangements to manufacture, by putting in new machinery, and with a full force of workmen, we are now ready to supply the GREAT DEMAND for these Badge Pins. They are made of 18k gold, and are perfect fac-simile of the present MORSE, or curved lever keys, and the new style WESTERN UNION straight lever and FANCY BASE KEYS. We are now making two different sizes, one to be three-quarters of an inch long, and the other one inch long. Also, a very small, neat, BADGE KEY PIN for LADY OPERATORS. These are the only badge pins ever got up exclusively for Operators.

We are, also, manufacturing a complete set of RAILROAD BADGE PINS, for CONDUCTORS, BAGGAGE-MASTERS, BRAKEMEN, STATION AGENTS, and others, consisting of Punches, Passenger Cars (Pullman's Palace Pattern), Switch Targets, Coupon Tickets, &c. These Badges are all made of the most approved patterns.

PRICE LIST.

Key Pin, oval base, one inch long	$6 00
Key Pin, oval base, ¾ inch long	5 00
Key Pin, fancy base, one inch long	7 00
Key Pin, fancy base, ¾ inch long	6 00
Key Pin, oval base, (for Lady Operators)	5 00
Key Pin, fancy base, (for Lady Operators)	6 00
Key Pin Charm (for Watch Chain)	$5 00 and 6 00

☞ The above are made with straight or curved Levers. ☜

Conductor Punch Pin	$4 00
Passenger Car Pin (Pullman's Palace Pattern)	6 00
Switch Target Pin	4 00
Coupon Ticket Pin (enamel)	4 00

☞ The above are all made 18k gold (warranted). ☜

Persons ordering Key Pins, be particular in giving style of lever and base wanted.

Any of the above will be forwarded by express, C. O. D., or by mail, registered, by sending amount and twenty-five cents extra to pay postage and registration fee.

Address,

HARVEY & DOW,
ST. JOHNSBURY,
Vermont.

GRAY & BARTON,

479 STATE STREET, CHICAGO, ILL.,
KEEP IN STOCK THE FOLLOWING ARTICLES:

GALVANIZED WIRE,
COMPOUND WIRE,
SCREW GLASS INSULATORS,
(Cauvet's Patent).
BRACKETS, PINS, SPIKES,
BROOKS' INSULATORS,
PLIERS, VISES, PULLEYS, CLIMBERS,
WINDOW TUBES, BATTERY BRUSHES,
SYRINGES, FUNNELS, HYDROMETERS,
ACIDS AND CHEMICALS FOR BATTERIES,
KERITE WIRE,
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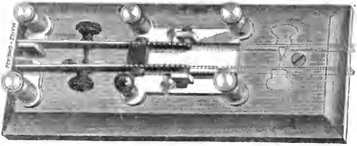
SWITCH CORD,
CALLAUD BATTERY,
DANIELL BATTERY,
GROVE BATTERY,
BUNSEN BATTERY,
LECLANCHE BATTERY,
HILL BATTERY,



REGISTERS,
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MEDICAL INSTRUMENTS,
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PLUG CUT-OUTS,
CUT-OUTS, (new style),
REPEATERS,
SWITCHES,
GALVANOMETERS,
INDUCTION COILS,
ALARM BELLS.

☞ Our Morse Instruments are of the Western Union, Ottawa (or Caton) style.

We have ample facilities for the execution of every variety of electrical work.

SCREW GLASS INSULATORS AND BRACKETS,

Of the size and thread used by the Western Union Telegraph Company.

Having secured an Exclusive Agency for these Insulators, (manufactured under the Cauvet patent,) we are filling orders promptly for large or small quantities, at prices as low as any Insulator can be sold for in the market.

GRAY & BARTON,

479 State St., Chicago.

GALVANOMETER,

AND RESISTANCE COILS,

On the principle of the

WHEATSTONE BALANCE.

We have supplied a large number of these

INDISPENSABLE HELPS

Towards securing a good working telegraph line to various Superintendents and operators, and can supply orders on short notice, as we keep the instruments in stock already finished.

Our Galvanometer is designed expressly for Telegraph Service—is light, portable, and easily handled.

GRAY & BARTON,

479 State St., Chicago

WIRE IN BOND.

For the accommodation of the
SOUTH AMERICAN, CUBAN and MEXICAN TRAD ,
we shall hereafter keep a stock of the Celebrated

"JOHNSON" WIRE,

both plain and Galvanized, in Bond, ready for shipment from New York.

PRICES AS FOLLOWS:

No. 9, Plain Annealed	4¾ cts. Gold.
No. 9, Galvanized	5¾ "
No. 8, Plain Annealed	4¾ "
No. 8, Galvanized	5 "

This Brand of Wire is the best in the world, and has been adopted exclusively by the Western Union and many other Telegraph Companies.

We also continue to import this Wire for use in this country, notwithstanding the high rate of duty imposed by Congress in the interest of the monopolists. Any amount of it can be seen at our store at all times. The import duty on wire is now two cents per lb. gold, and 15 per cent. *ad valorem.*

L. G. TILLOTSON & CO.,
No. 8 Dey Street, New York,
Bliss, Tillotson & Co.,
247 So. Water Street, Chicago,

Sole Agents in the United States for "Johnson's" Wire.

Manufacturers of every description of

Telegraph Instruments, Battery and Line Material.

ELECTRIC TELEGRAPH WORKS.

FLEMING, POTTER & CO.,

N.-W. Cor. SECOND & CHESTNUT STS., PHILADELPHIA,

MANUFACTURERS of every description of

TELEGRAPH INSTRUMENTS,

ELECTRICAL APPARATUS, and

RAILWAY SIGNALS, &c.

☞ Inventor's Models carefully attended to. ☜

Western Union Telegraph Company.

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Stillman Witt, Cleveland.

PRESIDENT—William Orton.

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E. B. Wesley,
E. D. Morgan,
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James H. Banker,
A. B. Cornell,
Augustus Schell,
A. W. Greenleaf,
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R. H. Rochester, *Assistant Treasurer.*

George B. Prescott, *Electrician.*

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William Hunter, *Superintendent of Supplies and General Purchasing Agent, New York.*

A. H. Watson, *Storekeeper, New York.*

Thomas Orton, *Supply Agent, Chicago, Ill.*

CENTRAL DIVISION.

Anson Stager, *General Superintendent.*

Residence, Chicago, Ill.

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Superintendents of Districts.

	Residence.
District 1—J. J. S. Wilson,	Chicago, Ill.
" 2—R. C. Clowry	St. Louis, Mo.
" 3—W. B. Hibbard.	Omaha, Neb.
" 4—C. O. Rowe,	Pittsburg, Pa.
" 5—E. P. Wright,	Cleveland, O.
" 6—John F. Wallick,	Indianapolis, Ind.
" 7—George T. Williams,	Cincinnati, O.

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Thos. T. Eckert, *General Superintendent.*

Residence, New York City.

ASSISTANTS.

District Superintendents.

	Residence.
District 1—J. C. Hinchman,	New York City.
" 2—Robert T. Clinch,	St. John, N. B.
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INCORPORATED UNDER THE LAWS OF THE STATE OF NEW YORK.

I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and the payment of dues.

XI. A meeting for the election of officers shall be held annually during the first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written request of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer.

GERRITT SMITH, Secretary.
A. S. BROWN,
W. H. HILL,
D. R. DOWNER,
Executive Committee.

DIRECTIONS TO APPLICANTS.

1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to Gerritt Smith, Secretary Telegraphers' Mutual Life Insurance Association, 145 Broadway, New York, and a certificate of membership will be sent by return mail.

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

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JOURNAL OF THE TELEGRAPH.

VOL. IV. NO. 11. NEW YORK, MAY 1, 1871. WHOLE NO. 84

ANCIENT SIGNALS AND EXPRESSES.

The great desire of the present age seems to be for speed. The world clings most fondly to the proverb that "time is money;" and considering how much varied experience can be compressed into a few years by the greater rapidity of movement that the costly undertakings we see around us place at our command, we might almost reverse the proposition, however illogically, and say that "money is time!" Distance, now-a-days, counts for nothing. A train only goes twenty-five miles in an hour, and we call it slow; a racing-boat is propelled by its crew upwards of four miles in twenty-five minutes, and the "time" is pronounced to be "bad;" or, again, a man complains that he has been "almost a whole month" coming from India—a matter of some seven thousand miles.

But the most telling phase of this quickness of communication is, of course, the immense development of our telegraphic system. The successful laying of the Atlantic Cable was the signal for schemes of ocean-telegraph lines everywhere; such an increase as will perhaps attend the taking up of the telegraphs by the General Post-office. Already there are three lines at work between Europe and America; and the Exchange and the Bourse on one side, and Wall Street on the other, are not satisfied save with the news of the last few hours from the opposite continent. Not long ago the newspapers were full of grumbling at the tardy arrival of news from Bombay or Kurrachee, when a *few hours* (save the mark!) might have sufficed; and now we have contrived to beat the sun.

But if our almost universal "express messenger" at the present time is the telegraphic wire—a quite recent innovation—it may be a matter of interest to inquire how men of old fared in this matter—not our own forefathers, but those who lived and struggled, and thought and toiled, in those bright classic days which possess for us so mighty a charm, holding up the mirror to us, that we may behold our own lives "writ small," so to say. We have but a few scanty notices on this point of ancient telegraphs and signals; but by comparing them together, and illustrating, it may be, from more modern fashions among primitive races, a clearer idea will perhaps be gained.

Fire would naturally suggest itself as the earliest and most ready mode of signalling, as the eye is so easily attracted by light. This, of course, would be most effectual during the night, though a thick smoke would show on a clear day at a considerable distance. Accordingly, as far back as old Homer, we find Sinon represented as signalling to the Greek fleet to return from Tenedos, now that the stratagem of the "wooden horse" was successful, by lighting fires on the shore. Æschylus, in his *Agamemnon*, describes, by the mouth of Clytemnestra, how the long-looked for capture of Troy was made known at Mycenæ. From point to point the glare of the beacon-flame spreads its news—from Ida to Lemnos, Athos, Macistus, Messapium; from the dun heights of Cithæron to Ægiplanctus, which passes on its tale of victory across the Saronic Gulf to Arachnæus, a hill in the hero's home-territory; and the weary sentries of Mycenæ hail with joy the downfall of their foe, and wait their liege lord's speedy return. This passage will recall to the memory the famous parallel, if not imitation, by Macaulay, in his *Lay of the Spanish Armada*, where the bale-fires rouse England, from Plymouth to Carlisle, for defence against the foe.

Later on, in more historical times than those of Troy, Mardonius, the Persian commander left in Greece by Xerxes, is represented as prepared to telegraph the capture of Athens to his master at Sardis, by similar means. But, at the time of the Persian war, fire-signals had been brought to a considerable degree of accuracy. Herodotus tells us that as the Greek fleet lay at Artemisium, waiting for the Persians, it became known to them by fire-signals that their three look-out ships had been captured by the enemy, though, whether they learned in the same way that the crews had made their escape, is not quite clear from the passage.

The daring menace of Brasidas, in the early part of the Peloponnesian War, on the harbor of Piræus, was telegraphed to Athens by fire-signals. There was, however, on this occasion much confusion as to whether Piræus or the island of Salamis was the point threatened. This may either have arisen from the defective state of the art of signalling, or, not improbably, insufficient preparations had been made for conveying the news of so utterly unexpected a piece of audacity on the part of the cautious Spartans. At any rate, it is but very little while after this that, as we are told by Thucydides, signals were made by night to the Peloponnesian ships cruising near Corcyra of the approach of certain ships; that they were Athenian, and therefore hostile; that they were sixty in number, and that they were coming from the direction of Leucadia. The use of the verb, too, in the passage (ἐφρυκτωρήθησαν) indicates that the art was much practiced.

This elaborate use of fire-signals at sea was fully equalled by the information that could be thus conveyed in land operations. The well-known description of the escape of the Platæan garrison is a proof of this. It would appear that the daring party who made the sally owed their safety in some measure to the *advance* which had been made in the art of fire-signalling; for the besiegers, finding that their enemies had passed the wall of circumvallation, signalled to Thesbes an attack; but the Platæans left in the town had foreseen this, and had prepared a number of counter-signals, to create confusion, and render the Peloponnesian signals indistinct, so as to favor the escape of their comrades. Now, if the mere showing of lights had been a signal of danger, the raising of other signals from the town would but have put the Thebans still more on the alert. The instance mentioned above of the Athenian ships, showe that *direction* could be indicated with no little accuracy, perhaps by waving lights steadily towards the point to be guarded. We may therefore suppose that the Platæans in the town waved in the contrary direction; and if they likewise gave a different account of the number of foes to be expected, it is easy to see that the possibility of a large force from Athens having suddenly appeared to raise the siege, or even to attack Thebes itself, would completely paralyse the movements of the Bœotians, and make them unwilling to divide their force, or to quit the city, till such time as the Platæans should have reached "dun Cithæron's ridge."

These are some of the most striking instances of the use of fire-signals among the ancients. Perhaps we may add to them a notice which Cicero gives of the approach of freebooters being marked by raising a fire on some conspicuous place: "*Prædonum adventum significabat ignis e specula sublatus aut tumulo.*"

Fire-signals were thus, as we see, used considerably *at night;* but how information was as rapidly and accurately conveyed by day, is not very clear. There are, however, one or two somewhat notable instances. Herodotus tells us that, after the failure of the Persians at Marathon, a party in Athens, suspected to be the Alcmæonids, who wished for the restoration of Hippias, held up a bright shield as a signal to the Persians that they should sail round Cape Sunium, and make a sudden attack on the city, while the army was still absent. Where this shield was held up, we are not told. Probably it was on some high point of Mount Pentelicus, between Athens and the Bay of Marathon (near which our countrymen were so lately massacred by brigands). At any rate, from the description, it seems to have been near the city; and it may appear strange that so slight a mark should have been observed at a distance of, perhaps, eight or ten miles. But every one must have noticed how often windows will "glimmer red" in the setting sun, from a long way off, looking almost like a house in flames; and a brightly burnished shield would, in like manner, reflect the rays of the sun to a great distance. We may also take into account the clearness of the atmosphere of Attica:

> And to thy sons, Olympian Jove had given
> A brighter ether and a purer heaven.

Very different to our own cloudy sky. Moreover, it is not impossible that the ancients may have trained men who were gifted with long-sight to look out for such tokens, as Macaulay indicates in his *Lay of Lake Regillus:*

> Caius, of all the Romans,
>   Thou hast the keenest sight;
> Say, what through yonder cloud of dust
>   Comes from the Latian right?

It is wonderful how the faculties can be quickened in this way by practice. We hear of the Indians and the backwoodsmen detecting objects at a distance impossible to the unpractised eye. DeQuincey speaks of the marvellous sagacity of the Cumberland hills-men in finding their way in spite of blinding mists and snow-storms. And, again, we, who have ready access to *books*, are struck with the retentive *memory* displayed by the Rhapsodists of Greece, among whom to recite the whole of the *Iliad* was no uncommon feat.

The shield was apparently well known as the signal for attack. The admiral's ship in a fleet showed a shield at the stern as a signal for battle. Among the Romans, however (as we gather from Plutarch's description of the battle of Cannæ), a red flag flying over the consul's tent served this purpose. It is by no means unlikely that the ancients made far more use of the human voice for conveying information than we are in the habit of doing. The soft air of the south of Europe disposes the inhabitants to much more frequent and powerful use of the lungs in speaking, than is usual in the cold and bleak north. Greek statesmen were in the habit of addressing large crowds out-of-doors, in the *Agora*, or the theatre; and the profession of a herald required the continual practice of a naturally clear and commanding voice. Thus nature seemed to combine with art for the purpose; and it is a curious fact, that in Albania, at the present day, the natives are wont to pass messages from hill to hill of their rocky and echoing country by a peculiar intonation of the voice; so that places many miles distant are thus brought within a few minutes' communication with each other. This phenomenon of mountain districts has been remarked by Sir Walter Scott in *Anne of Geierstein:* "The voice, again, called to him with the singular shrill modulation of the mountain halloo, by which the natives of the Alps can hold conference with each other from one mountain ridge to another, across ravines of great depth and width." With this may be compared the giving of the law from Mount Sinai, the blessings and cursings from Ebal and Gerizim, Jotham's parable, from the ridge of the hill, to Abimelech's partisans.

Another well-known means of sending news rapidly, in a country with such bad roads as Greece, was by *trained runners*. Thus we are told that Phidippides, a professional courier, ran from Athens to Sparta to beg for aid, just before Marathon; arriving at the latter city at the end of the second day, and this was a distance of one hundred and fifty miles. The constant gymnastic training in which Greek, and especially Spartan soldiers kept themselves, enabled whole armies to make very rapid forced marches. In the present instance, the Spartan army, though slow to start, yet, when it did march, performed the distance in three days. So, the old Chasseurs de Vincennes, the picked light troops of the French army, were trained to make swift marches by running one on either side of a cavalry soldier, whose stirrup-leathers they caught hold of. This, we believe, or something like it, is still kept up among the Zouaves. The episode of the Fiery Cross, in the *Lady of the Lake*, shows how quickly a district may be aroused by a well-organized system of running messengers. Indeed, the swiftness of rumor is as proverbial as its exaggeration. Lady Duff Gordon, in her voyage up the Nile, found that the news of her approach invariably outstripped her movements, rapid as they were. The curious story, given by Herodotus, of a herald's staff found floating on the sea at Mycale, and of the rumor that straightway ran through the Greek host of a battle won by their countrymen in Greece Proper, that very day (at Platæa), is also a case in point. In countries more favorable for speedy traveling, much use was made of horses and other animals. The admirable system of roads and posts instituted by the kings of Persia throughout their vast dominions—"the posts that rode upon mules and camels," as we have it in the Book of Esther, excited the wonder of Herodotus, who says emphatically that "there is nothing in the world swifter than these messengers!" At the present time, an Arab will not unfrequently travel a hundred miles in a day on one of their untiring horses.

The Romans with their straight roads, the primary object of which (as of Russian railways) was speed for military purposes, provided, we may be sure, the means for making the utmost of them. In the times of the Empire, post-houses were set up along the great highways every five or six miles, with about forty horses at each; so that a Roman ambassador, for instance, using these relays, might easily journey in his chariot a hundred miles a day.

Occasionally, ships were sent as express messengers; the *Salaminian* and the *Paralus* were used for this service at Athens. We do not know what rate of speed was reckoned upon. Herodotus calculates that a vessel would accomplish from six to seven miles an hour by daylight; but as he also assumes a certain amount of progress by night, he is probably speaking of a merchantman; for the crews of triremes often stopped at night and went ashore. The famous chase, mentioned by Thucydides, after the trireme conveying orders for the destruction of the Mytileneans, was noticed as an exception, the crew of the pursuing vessel sleeping by turns. As the first trireme had twenty-four hours' start for the distance between Athens and Lesbos, we can hardly put the pace of the other as less than ten miles an hour; so that the speed of a well-equipped Athenian trireme may have approached that of a modern steam-ship. Carrier-pigeons were not used, that we know of. To make the famous pigeons of Dodona carriers, would be pushing the rationalism of legend to an extreme point.—*Chambers's Journal.*

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ELECTRICITY—IS IT PRODUCED BY THE LIVING HUMAN BODY—INTERESTING EXPERIMENTS.

In the London Spiritualist, of February 15, are some remarks by Mr. Cromwell F. Varley, the well known electrician, on the supposed production of electricity by the living human body. He says the sparks produced by combing the hair, by drawing off silk stockings, or by rubbing the feet on carpet, are illustrations of frictional electricity, which in no way depend on vitality, but are due solely to the proper conditions in the substances rubbed together and in the atmosphere. He then comments on another form of supposed bodily electrification, which has led many people to suppose that the brain was an electrical battery sending electricity through the nerves to contract the muscles, and which is produced as follows: The terminals of a very sensitive galvanometer are connected each with a separate basin of water. If the hands be then placed one in each basin, on squeezing one hand violently a positive current is almost always found to flow from that hand, through the galvanometer, to the other hand which is not compressed.

While experimenting night after night on this subject in 1854, Mr. Varley found that after squeezing the hand, opening the clenched fist produced a momentary increase of power instead of a decrease; and when the wind was from the southwest, the power was less than one-fourth as strong as when it was from the northeast. The former wind was found to be slightly negative to the earth; the latter was invariably powerfully electro-positive. On trying to exhibit these currents on one occasion and finding them to be very weak, Mr. Varley washed his hands thoroughly in water containing a little liquid ammonia, in order to decompose the grease in the pores of the skin. The result was diminution instead of an increase of the power. On washing his hands, however, with a very weak nitric acid, and afterwards with water, he obtained more power on squeezing his hands than he had ever done during the most persistent east wind. This led to an explanation of the phenomena as one due to chemical action alone, the act of squeezing the hand violently forcing some perspiration out of the pores. By dipping one hand in a solution of ammonia and the other in one of nitric acid, and then washing both in water, squeezing either hand, produced a current in the same direction; and when both hands were placed in the water and a little acid dropped on one of them, a current was instantly generated without any muscular exertion. Mr. Varley finds no evidence that electricity exists in or about the human body, either as a source of motive power or otherwise; and would explain all the feeble electricity which has been obtained from the muscles as due to different chemical conditions of the part of the muscle itself.

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FOREIGN ITEMS.

From the Mechanics' Magazine.

Mr. Scudamore's report on the postal telegraph system has recently been published.

Sir Charles Bright is endeavoring to recover the Porto Rico Submarine Telegraphic Cable, but the rocky nature of the bottom renders grappling by steam impracticable.

A telegram from Bombay says that the news of the Oxford and Cambridge boat race took four minutes only to reach Bombay by the submarine cable, and thirty minutes by the overland Russian route.

The General Post-office have decided to at once extend telegraphic communication to Stornoway, in the Western Hebrides. The submarine cable to be laid across the Minch will be some 28 nautical miles in length, and submerged in water of the average depth of fifty fathoms.

Upwards of eighty messages were despatched from and received at Madras on the first two days after the opening of the Madras and Penang telegraph line. The Indian Government is about to erect an additional wire between Madras and Bombay, in anticipation of the utilization for business of the cables to China and Australia.

A commencement has been made with a line of telegraph from the Argentine Republic to Chili across the Andes. The new line will meet another telegraph wire at Valparaiso, which will soon be prolonged to the Isthmus of Panama, and thence to the telegraphic system of the United States.

It is expected that the broken section of cable between the Islands of Shapinsay and Eday, on the Shetland curcuit of the Orkney and Shetland Islands Telegraph, will be repaired about the first week in May. Owing to the rapid tideway and strong currents, from the exposed position of the Stronsay Firth to the North Atlantic Ocean, the operation attending the repair will be one of great difficulty and danger.

The steamships "Africa" and "Great Northern," now loading at North Woolwich with the section of submarine cable to be laid between Shanghai and Possiette Bay, on the Russian-Chinese frontiers, for the Great Northern Telegraph China and Japan Extension Company, will leave the river for their destination via the Suez Canal, about the 15th of this month.

In the recent boat race between the Universities of Oxford and Cambridge, which took place on the 1st of April, the result at the conclusion of the race timed to 10:33 A. M., was handed in by the General Post-office at 10:30 A. M. to the officers of the Indo-European Telegraph Company, and the Falmouth, Malta, and Gibraltar Telegraph Companies, both of which companies forwarded the news to Bombay apparently in five minutes, as it is stated to have reached Bombay at 10:44. The Indo-European Telegraph Company likewise forwarded the message to Bombay at 10:40 via Teheran, by which route Kurrachee was apparently reached at 10:43 and Bombay at 10:45. It must, however, not be forgotten that this apparent speed means several hours, owing to the difference in longitude eastward. Now as Bombay is some 75 deg. to east of Greenwich, and every 15 deg. to the east represents one hour of local time later, it follows that when it is 10 A. M. in London, the hour will be about 3 P. M. in Bombay, and as the message is stated to have reached Bombay at 10:44, the time occupied in transmission on the road from London to Bombay will have been about seven hours.

In the course of next month, if no accident occur, telegraphic communication will be established between Singapore, Hong Hong, and Shanghai. During the summer Japan will be included in the electric circuit. *Bon gre, mal gre*, the British merchant in China is thus on the eve of great changes. Probably he has looked on at the advance of telegraphic enterprise in the direction of his stronghold with feelings of considerable discontent. It is a curious circumstance connected with the extension of telegraphs in the far East that the people for whose service they are to be laid down, and by whose patronage they are to be supported, would probably, if they could control events, be glad to do without them. The foreign trade of China, large as it is, is carried on by a comparatively small number of great firms—a state of things unfavorable to the business of a telegraph company. But it is not unlikely that the introduction of telegraphs in China will have a visible effect in stimulating the growth of small firms. When the cables are all in work there will no longer be any such thing as exclusive information. Hitherto some firms have found it worth their while to run private steamers entirely for the sake of information. Poor traders had no chance against them under such a system. With telegraphs to fall back upon, however, the man of moderate means may keep himself just as well informed as the most wealthy of his contemporaries. It may thus ensue that while telegraphs in China may not enhance the profits of individuals, they may lead to an increase in the European populations of the foreign settlements.

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MAGNETIC ENGINES — THEIR POSSIBLE DUTY.

From the Scientific American.

In view of the recent extravagant claims made by persons interested in Payne's new magnetic motor, to which the attention of our readers has been called, the following calculation, from the "Journal of the Franklin Institute," will be of interest:

Attention has been drawn lately, in some of the public prints, to one or more forms of magnetic or electric engines, claiming to develop an available and economic motive power. It may be, therefore, of interest, or even of use, to put before our readers, in a few words and figures, the possibilities of invention and improvement in this direction.

The total mechanical equivalent of a pound of pure carbon, consumed with oxygen, is $7{,}900 \times 1{,}390 = 10{,}891{,}000$ foot-pounds; or, in other words, one pound of pure coal burned in one minute would, if applied with absolute economy to the development of motion, exert a force of $10{,}891 \div 33 = 332$-horse power during one minute; or, if burned during an hour, would exert $332 \div 60 = 5{\cdot}5$-horse power during the hour; or, again, each horse power would require $1 \div 5{\cdot}5 = 18$ of a pound of coal per hour, nearly, or say 1·5 pound. Now, as a matter of fact, a good engine and boiler does develop a horse power for each 5 pounds of coal consumed, being about 1-25th, or say 4 per cent. of what it might do if a perfect machine. This shows us that there is a large margin for improvement in reference to the duty of our steam motors, and that if, in any other manner, chemical force be converted into motion in a less wasteful way, some increase in the costliness of the fuel may not be inconsistent with economy. But this, like any other problem, has its limits, and these it is our purpose to define.

The total mechanical equivalent of zinc is $1{,}301 \times 1{,}390 = 1{,}808{,}390$, or, in other words, a pound of zinc consumed with oxygen in one minute would, if applied with absolute economy to the production of motion, develop a force of $1{,}808{,}390 \div 33{,}000 = 55$-horse power during that time; or, during one hour, $55 \div 60 = 91$, or, say, 1-horse power.

Or, in other words, zinc, being consumed in such a way that its total useful effect should be applied without any loss whatever, would, weight for weight, be about five times as effective as coal in its present wasteful manner of consumption. When, then, zinc is less than five times as costly as coal, and a perfect battery and electric engine have been invented, these will compete favorably with the steam engines of the present day.

With reference to some statements that have been published, it may be interesting to note that, from the above data, it is evident that with a perfect battery and engine, to develop 2½-horse power for ten hours, would demand the consumption of 27·4 pounds of zinc.

The same journal also has the following article on

THE MAXIMUM OF MAGNETIC POWER EVOLVED BY A GALVANIC BATTERY.

A curious succession of papers on the above subject has appeared lately in the *Chemical News*, from the Rev. H. Highton, in which that gentleman attacks no less important a principle than the conservation of force, and maintains no less difficult a thesis than the possibility of what is technically called perpetual motion, or the development of power without a corresponding expenditure of force. The subject would hardly be worthy of our notice but that, strange to say, these opinions have gone, so far, unchallenged in the pages of our learned cotemporary; and, in connection with schemes alluded to in the above item on galvanic motors, seem to have led astray some investigators.

The theory of the daring author above named is briefly thus: A battery current, passed through a given electro-magnet, will lift a given weight; if, now, we double the cross section of the wire of said electro-magnet, and also its length, the resistance of the circuit remaining the same as before, the current developed by the battery and the consumption of zinc will remain as before, and yet the lifting power of the magnet will be doubled. Or, in place of increasing the size and length of wire, several similar electro-magnets may be so introduced into the circuit as to produce the same effect. Such a process continued indefinitely would, of course, enable us to develop any amount of magnetic force from a given battery.

So far, well; but we have not yet come to the development of power, which implies motion. For this, it is evident that the electro-magnet must be charged and discharged, and here comes the compensating condition. To charge a double length of wire will take just twice the time, and therefore cause a double expenditure of zinc in the battery.

Our author, in fact, notices this, but remarks that "the electric current is so rapid that this difference of time is inappreciable within any practical limits." Without doubt, to advocates of perpetual motion, but not to those who can see that two millionths of a second are as much twice one millionth as two centuries are twice one; or to the zinc, which, having to work twice as long at each effort, will be doubly exhausted when a given number of actions has been completed.

[*Note.*—We publish the above as a set-off to our own "wild" article. The writer has studied the old lesson well. But he is in the primer. He sticks to the very axioms the correct basis of which is now denied. It is strange that Mr. Highton's articles have remained, in the main, unattacked by English scientific men. The subject may "not be worth mention here," but we expect to hear less of mechanical equivalents before long, or to see an acknowledgment that they have not hitherto been correctly related.]

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Remarkable Mirage.—A correspondent of the Rochester *Express* writes as follows: The undersigned was one of the hundreds at Mount Hope on Sunday afternoon who witnessed, probably, one of the most perfect and sublime mirages ever seen in this country. On the entire north sky as far as the angle or bison, was lifted the blue waters of Lake Ontario, while reflecting from her bosom could be seen the mountains, hills, valleys, bays and rivers on the Canada shore inland for miles. The coast could be plainly seen over a stretch of fifty miles, and so perfect at one time that the forests could readily be, distinguished. The reader can form some idea of its grandeur by knowing that a conutry separated from Rochester by a lake seventy to one hundred miles in width was, as if suddenly, by the great hand of its Creator, painted upon the heavens so plain as to be seen from a standing point one hundred miles distant. Gentlemen present who were familiar with the Canada shore could readily distinguish Rice Lake, Belvidere and other prominent points in Canada. The lake looked as though it had, by a great tidal wave, rolled upon Rochester, had covered one entire half of the city, as no building could be seen north of Main street, or any land between the city and the lake.

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Going East.—George H. Mumford, of the Western Union Telegraph Company, goes East on the steamer, Monday next, to accept a leading position in the office of the Company in New York city. He came out here some four years ago to assume the management of telegraph matters on this coast. He thoroughly reorganized the service in every department, greatly increasing its efficiency and enlarging its revenue. He has shown great business capacity; while his policy toward the public has been equally intelligent and liberal. Holding a position that was alike trying and responsible, in every instance, he proved himself equal to the emergency—a fact which the company properly recognize in his present promotion. The effect of his organizing ability is evidenced in the fact that he leaves the office here in the very best condition, and in the best of hands. We regret to lose him, because he is in the best sense a live man, a courteous official and an accomplished gentleman.—*San Francisco Bullet'n.*

HOW TO KEEP A BATTERY BRIGHT ALL THE YEAR.

AUGUSTA, Me., April 22, 1871.

To the Editor of the Journal of the Telegraph:

Your correspondent (M. F.) seems to think my statement in the JOURNAL, in relation to locals, rather incredible, and is inclined to make light of it; but his feeble attempt to appear smart or witty does not change the facts at all. I run my local a year without cleaning, and might have run it longer, but I had accomplished my object in running it a year, and was using more vitriol than was necessary, if cleaned. I use only three ingredients in my battery, and M. F. can accomplish the same, if he only has the *supplies*. In the first place, I keep my battery in a tight box; I have glass jars; my zincs have a wire run through them to rest on the top of the P cups, which keeps them from touching the bottom of the cups. I keep my jars about three-fourths full, and my P cups full all the time. I keep the tops of my jars and the connections clean and dry. When I go out of the office, if only for a few minutes, I put the cut-out on, as I think I save my battery by giving it all the rest I can; but the whole secret, if there is any, is this: I do not stuff my battery with vitriol; when I set it up new I put in just enough vitriol to make it work well, and I kept it so, by adding a very little two or three times a week. I think the great error with operators is in thinking they must keep undissolved vitriol in their jars, and that is the main cause of their having to clean their batteries every week or two. That has been my experience. I changed my zincs last January, and the 14th of February I bought two pounds of vitriol and have enough on hand to last till the middle of May; and I intend to run these zincs a year or more without cleaning. I supposed it was the vitriol that made the dirt; therefore my object was to run my battery with as little vitriol as possible. I put it into a tight box to prevent evaporation, if there was any, by being exposed to the air, and kept my P cups full to get the whole benefit of the zincs. I kept the jars about three-fourths full to keep the tops of the jars, cups, &c., clean and dry. I used just vitriol enough to keep a good working battery, and used it only while I was in the office, which was about nine hours a day. There is no signs of any copper on my cups. So you see, my friend M. F., I use nothing but pure cold water, vitriol, and common sense. How are you on for supplies?

Yours truly,

E. H. WALKER,

Opr. and Ticket Agent P. and K. R. R.

Note by Ed.—We commend the above letter of Mr. Walker to general attention. It is one of the most important items we have been called to publish in some time. It reveals the source of an immense waste and great unnecessary labor. Common sense is an important ingredient in anything, and there seems to be a good supply at Augusta. Mr. Walker, we give you honor for your valuable hint. It should be read by every manager throughout the country. A foul battery should henceforth be unknown. This is not the only thing in which there is a waste of power. The great art is to find the relations of things, so that force will not react upon itself and neutralize its own action. Mr. Walker has done a valuable service in this direction.

BATTERY FORCE.

To the Editor of the Journal of the Telegraph:

I beg leave to plead *not guilty* to the charge which Mr. Highton prefers against me in his note in the last JOURNAL—the charge of my having fallen into a mistake.

I did not say "that a battery is exerting its maximum force, or producing the greatest intensity of current, when the external circuit is equal to the internal." I was not discussing, and did not care to consider, what force a given battery was capable of exerting, or what intensity of current it was capable of producing. Nor did I feel called upon to decide what length and section of external circuit would give the greatest magnetic power. These were questions I was content to leave to Mr. Highton for discussion.

But it seemed to me that Prof. Phin had misapprehended Mr. Highton's question, in that he had sought to limit the magnetic power to that length of wire (limited also in section) which equalled the resistance of the battery. My endeavor was to show that even this did not limit it, but that the magnetic power in the external circuit might be indefinitely multiplied even whilst the resistance of the external circuit remained the same as the resistance of the battery, or whilst the external circuit had that relation to the internal which would give the greatest amount of chemical work in the external circuit. This relation is shown by Mr. Highton himself to be that of equality. DYNAMICS.

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BRITISH TELEGRAPH COMPENSATION.

There still remain, we understand, a great number of railway companies with whom the Post Office have not yet made terms, the length of whose railways may be roundly stated to be about 5,000 miles, and whose paid-up capital is little short of 200,000,000*l.*, and if the accounts we hear are at all trustworthy there is every reason to expect that the claims will only be settled by the process of arbitration.

The amounts paid to each of the telegraph companies are given in the schedule appended to the Telegraph Act of 1869, and are as follows:

	Amount payable to telegraph companies under the Telegraph Acts. £	s.	d.
The Electric and International Telegraph Company	2,938,826	9	0
The British and Irish Magnetic Telegraph Company	1,243,535	0	0
Reuter's Telegraph Company (Limited)	726,000	0	0
The United Kingdom Telegraph Company	562,264	0	11
The Universal Private Telegraph Company	184,421	10	0
The London and Provincial Telegraph Company	60,000	0	0
	£5,715,048	8	11

The Electric and International Telegraph Company, the oldest and most flourishing of the telegraph companies, had, at the time of its acquirement by the Post Office, 10,289 miles of telegraph line, a mileage co-extensive almost with that of the railways in this country, whose lines for the most part it traverses. Its paid-up capital was 1,169,874*l.*, consequently it appears to have received about 251*l.* for each hundred pound of its share capital, or something like 285*l.* a mile for every mile of telegraph line it possessed; this, at 4 per cent. interest, would represent about 11*l.* 8s. as the value of its net receipts per mile. The amount paid by the Post Office in the case of the South-Eastern and London, Chatham, and Dover Railway Telegraph claims, would in the same way be equivalent in annual value to 35*l.* net receipts per mile on the whole of the mileage of those railways. Assuming, therefore, that the telegraph value of the interests of the other railway companies, who had not yet settled, to be some intermediate point between the 35*l.* per mile obtained by these two railway companies and the 11*l.* 8s. per mile paid to the Electric and International Telegraph Company, say, for instance, 20*l.* per mile, we should get, roughly, something like 100,000*l.* per annum as the value of the railway companies' interests on the 5,000 miles of telegraphs on their respective lines. Already the amounts paid by the Post Office in settlement of the telegraph companies' claims and such of the railway companies as have come to terms, exceed 8,000,000*l.*, and if to this we add the capitalised value at 4 per cent. of this 100,000*l.* per annum, we shall find that the transfer of the telegraph to the Post Office will have from first to last cost the country something like ten and a half millions sterling—an amount, it is true, greatly in excess of Mr. Scudamore's estimates, but still in our opinion very much less than the real marketable value of this most remunerative property.—*Engineering.*

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A VERY interesting telegraphic feat has been performed on the East India telegraph line, by which instantaneous communication was kept up over 6,000 miles of wire. The experiments were made on the Indo-European line, via Teheran, to work direct, without any retransmission, between England and India. This hitherto unprecedented result was actually attained. Communication was first established direct between London and Kurrachee. The director at Kurrachee sent the following message to London: Kurrachee, 8th, 5:36 P. M. This message is the first really sent from India to England instantaneously. By Indo-European line we work now easily and quickly direct with London. A commercial message was forwarded from London direct to Kurrachee for Calcutta immediately afterwards. Kurrachee then put the line direct through to Bombay. Bombay and London then interchanged signals perfectly, and a commercial message was sent to Bombay direct by London at 1:58 P. M., and was instantaneously acknowledged. This is the first occasion on which the telegraph has worked direct, without any retransmission, between England and India.—*N. Y. Standard.*

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ONEIDA, N. Y. April 10, 1871.

To the Editor of the Journal of the Telegraph:

The following I think is deserving of a place in the JOURNAL, showing how much a letter will change the entire meaning of a telegram. A message was addressed the other day to the wife of one of our assemblymen, sent by a friend, to have her meet him at the train with a horse.

The message was received, meet K. with hearse at depot at 5.30. A repetition of the message was sent for, but the same reply was received. His friends, hearing of the message, met in groups on the street, and at the depot, and many thought the message must be wrong; but as he was expected home a day earlier, they did not know but something might have happened to him. Finally the train arrived, and the corpse walked out of the car, and such shouts as rent the air made the dead man open his eyes, and of course he wanted to know the meaning of the excitement, which was soon explained. The word "hearse" should have been "horse." The undertaker, being present, was cheated out of his job, and many proposed there should be a treat to pay the funeral expenses.

Yours,

FRED. GIBSON.

WESTERN UNION TELEGRAPH COMPANY.

LIST OF OFFICES IN NEW YORK AND BROOKLYN.

NAME OF OFFICE.	LOCATION.
* † General Office	146 Broadway, cor. Liberty.
Astor House	Broadway, cor. Vesey.
Astoria, L. I.	Cor. Fulton and Main.
Allerton's, West	Drove Yards, W. 40th st., cor. 11th av.
Appleton's, N. Y.	D. Appleton & Co.'s, 549 and 551 B'way.
Appleton's, L. I.	D. Appleton & Co.'s factory, Williamsburg.
Broad Street	No. 22, near Exchange Place.
† Brooklyn, L. I.	333 Washington st., near Post Office.
Beaver and William st.	S. E. corner.
Barge Office	Marine News Depot, near South Ferry.
Board of Brokers	Stock Exchange, 12 Broad.
Cosmopolitan Hotel	129 Chambers, cor. West Broadway.
Chambers Street	S. W. cor. Broadway.
Canal Street	S. E. cor. Broadway.
Claflin's	H. B. Claflin & Co.'s store, 140 Church.
Corn Exchange	Cor. Pearl and Moore.
Coleman House	Cor. Broadway and 27th st.
Castle Garden	The Battery.
Cooper Union	7th st., cor. 3d and 4th avs.
Dry Dock	Greenpoint Ferry-house, foot E. 10th st.
Earle's Hotel	Cor. Canal and Centre.
Everett House	Union Square, cor. 4th av. and E. 17th st.
Eighth Avenue	No. 95, bet. 14th and 15th sts.
* † Fifth Av. Hotel	5th av., cor. 23d st.
Franklin Street	Comm'l Agent's Exchange, cor. B'way.
Fulton Market	33 Fish Market.
Fort Hamilton, L. I.	Church's store.
Grand Central Hotel	Broadway, opposite Bond st.
Gold Room	18 New st.
Grand Hotel	Cor. Broadway and 31st st.
Hoffman House	Broadway, bet. 24th and 25th sts.
Hunter's Point, L. I.	Long Island Railroad Depot.
Harlem	Harlem R. R., 4th av., bet. 124th and 125th sts.
Metropolitan Hotel	Cor. Broadway and Prince.
Madison Square	945 Broadway.
Manhattanville	Hudson River R. R., 125th st., N. R.
New York Hotel	Broadway, cor. Washington and Waverley place.
News Room	Merchants' Exchange, 50 and 52 Pine.
National Drove Yards	100th st., bet. 3d and 4th avs.
Pier 30, N. R.	
Pier 40, N. R.	
Park Hotel	Cor. Beekman and Nassau.
Pearl Street	No. 134, near Beaver.
Park Place	Westcott's Express, No. 7 Park Place.
St. John's Park	H. R. R. R. freight depot, cor. Laight and Varick.
St. James Hotel	Cor. Broadway and 26th st.
St. Nicholas Hotel	515 Broadway, cor. Spring.
Sixth Avenue	C. A. Kittle's, 765 6th av., near 43d st.
Stewart's	A. T. Stewart & Co.'s, cor. Broadway and Chambers st.
Station "H"	P. O. Station "H," 978 3d av.
South Brooklyn, L. I.	Hamilton av., cor. Union st.
Trinity Buildings	Room No. 9.
Twenty-sixth Street	Cor. 4th av., Harlem R. R. depot.
Twenty-seventh St.	Cor. 4th av., New Haven R. R. depot.
Thirtieth Street	Cor. 10th av., Hudson River R. R. depot.
Union League Club	Cor. 26th st. and Madison av.
Wall Street	No. 21, cor. Broad.
Washington Market	100 Vesey st.
Williamsburg, L. I.	67 North 4th st.
Westchester House	Cor. Bowery and Broome.
Yorkville	P. O. Station "K," 171 East 86th st., near 3d av.

Offices marked * are always open.
Offices marked † are open on Sundays.

◆

THE ENGRAVING.

From what we can learn, the engraving of Prof. Morse has given satisfaction to all those who have received it. We hope orders will multiply.

In answer to some requests for autographs of the Professor, we have the pleasure of saying that in answer to our inquiry Mr. Morse is willing to gratify this desire to any extent we may require.

Now, as money is needed yet for inaugural purposes, we make this bargain: All who order the engraving will receive with it an autograph of the Professor. Those who see it will wonder at the beauty and steadiness of its chirography, when they remember that it was written by one who has now passed the boundary of four score years. The profits from the engraving will be all needed to complete handsomely what has been so handsomely prosecuted.

TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

We give members the following as the condition of the association in the matter of dues, April 24, 1871:

Cer.	Owes.	Cer.	Owes.	Cer.	Owes.
24	$1 00	538	$2 00	857	$3 00
34	1 00	546	1 00	860	2 00
38	1 00	550	3 00	861	2 00
45	1 00	565	1 00	862	1 00
61	1 00	583	1 00	877	1 00
64	1 00	586	1 00	881	3 00
98	1 00	588	1 00	886	3 00
100	1 00	590	1 00	893	3 00
116	3 00	599	3 00	909	1 00
126	1 00	609	1 00	916	1 00
133	1 00	628	1 00	917	1 00
171	1 00	634	2 00	919	2 00
178	1 00	637	3 00	928	3 00
188	1 00	642	1 00	934	2 00
199	2 00	643	3 00	961	1 00
212	1 00	645	3 00	965	1 00
217	1 00	647	1 00	969	1 00
235	1 00	652	1 00	972	1 00
242	1 00	667	1 00	973	3 00
251	1 00	673	3 00	974	1 00
260	1 00	686	2 00	981	3 00
292	2 00	698	2 00	984	2 00
305	2 00	706	2 00	988	1 00
317	1 00	710	1 00	990	2 00
331	3 00	718	3 00	993	3 00
338	3 00	723	1 00	997	3 00
361	1 00	748	2 00	1003	3 00
381	1 00	757	1 00	1012	1 00
388	1 00	761	3 00	1015	1 00
390	1 00	770	1 00	1020	1 00
395	1 00	779	1 00	1021	2 00
442	1 00	792	1 00	1022	2 00
452	2 00	795	1 00	1028	1 00
462	1 00	807	2 00	1035	1 00
473	1 00	824	2 00	1065	1 00
490	2 00	839	2 00	1070	1 00
501	3 00	840	2 00	108[illegible]	1 00
521	2 00	850	1 00		
525	3 00	854	1 00		
530	3 00	855	1 00		

Members will bear in mind that it is now nearly three months since a death occurred, and yet, although so long time has elapsed, 130 have failed to pay the assessment then made. Of course, should death occur to any of these, their insurance would be forfeited. It thus happens that, although there are enrolled over 1,100 members, the effective reliable number cannot be stated as exceeding 800. The highest amount yet paid to survivors was $729.

◆

LIGHTNING conductors conduct only on their surfaces. A hollow tube, slit longitudinally, will conduct both on outside and inside surfaces, or if open at both ends will conduct on both sides. The resistances of conductors vary as their cross sections.—*Scient. American.*

◆

THE MORSE ART PROFESSORSHIP.

An interesting meeting was held last evening, at the house of Professor S. F. B. Morse, in connection with the plan already definitely formed for the establishment of a woman's university in this city. The chair was occupied by the Rev. Dr. Anderson, and after addresses from several gentlemen eminent for scholarship, it was determined to endow a special chair on art, to bea the name of Professor Morse, on a foundation of $20,000, of which $3,000 was at once subscribed. Among the influential citizens present at the meeting were Peter Cooper, Samuel J. Tilden, and Benjamin H. Field.

LIGHTNING conductors frequently have not as good a connection with the earth as they should. A lightning conductor having its earth extremity partially insulated soon becomes charged if a storm cloud passes over it, and then a lateral discharge takes place; hence the accidents which have frequently taken place in buildings supposed to be adequately protected. Sand and gravel, brickwork, and stone are bad conductors of electricity, and if the rod has such a base, and the surrounding earth be likewise dry, it is practically insulated. The difficulty of getting what telegraphic operators call a good earth is one that should weigh with those putting up lightning conductors. They should not rest satisfied that all is secure unless they can reach a running stream of water, or else sink a considerable surface of copper plate till permanently damp earth is reached.—*Mechanics' Magazine.*

◆

J. B. ELKINTON, Birmingham. *Wire for telegraph conductors.* Dated September 20, 1870.

Copper, deposited from a solution by the aid of electricity, is the most suitable material to employ, but it is found that in melting such copper its conducting power is liable to be impaired. The inventor produces telegraphic conducting wire from deposited copper without melting. He deposits from a sulphate or other solution of copper into a mould a plate of pure copper of about one-eighth of an inch in thickness. The plate he cuts into strips, which are drawn down in the ordinary way through dies into very thin wire. He then takes lengths of this wire and suspends them in depositing vats of suitable size (say about seven feet deep), and allows them to remain in until they are from three-fourths of an inch to one inch thick, when they are removed from the vat and drawn down by rollers and dies into wire by the ordinary method. Patent completed.

◆

SOME messages are curiosities. Here is a veritable message, written by a Missourian to his "Mary:"

To Mary:

Jefferson City, Mo.
I ate five eggs and am happy.
Come.

It is said that Mary arrived at 3:40 P. M.

◆

A LETTER, enclosing $1, post-marked Jackson Branch R. R., but without further address, is in our hands waiting the sender's orders.

◆

A LARGE REWARD.

To offer a large reward for the solution of an intricate problem in mechanics or engineering, has the certain result of bringing forward a myriad of alleged improvements, from which something of tangible value and utility may very often be selected and applied. Acting on this idea, certain parties in the Legislature of the State of New York have introduced a bill offering a reward of fifty thousand dollars for the best plan of canal navigation in the employment of steam, caloric (!), or electricity as a motive power. The object is, of course, the laudable one of securing the highest possible speed in the transport of freight upon the slackwater lines of transit in the State, and the bill has passed to a third reading in the Assembly. We could wish, however, that those who drew the bill had shown greater familiarity with the nature of available motive power, and confined the wording of the bill to the use of steam, for caloric engines, whatever their utility under many circumstances, could hardly be economically applied in canal-boat propulsion, while the use of electricity for such a purpose is justly classed by engineers as one of the vagaries of unscientific and impracticable dreamers. The proposed reward is a large one. It should awaken inventors to the imminent need of some effective method of substituting the steam engine for the tow-horse, and will doubtless not only have this result of bringing forward many new projects, but of reviving no small number of old ones that hitherto, from one cause or another, have been suffered to be neglected and unused. —*American Artisan.*

The ignoring of magnetic power in the above, which we take from the leader of that excellent paper the *American Artisan*, is taking a stand against progress which is unwise and unphilosophic. Many minds are still hopeful of great results from this source, and, spite of all appearances to the contrary, magnetism may yet prove the new horse which will tow our canal boats from lake to ocean, and take the $50,000 prize!

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, MAY 1, 1871.

THE FUND COMPLETE.

On this first morning in the ever welcome month of May, we have great pleasure in stating that the entire amount needed, as far as we can now see, for the payment of the statue, the masonry, the printing, and all contingencies up to date, has been provided. This result was attained by the personal presentation of $2.56 from L. C. Orvis, manager, Manchester, Vt., closing the fund for the statue, and $25 from Hon. Ex-Governor Edwin D. Morgan for masonry and contingencies. Thus our faith in the intelligence and large-heartedness of our companions in labor has been triumphantly justified. We have never doubted the result. We believe now that had we proposed a more imposing artistic creation, costing twice as much, it would have been as promptly provided. Let no one hereafter dispute the gallantry and generosity and intelligence of the American telegraphic craft. Never was a subscription so spontaneous, so wholly voluntary, so wide-spread, so attended with the evidences of cheerful giving. This last element has given the undertaking its distinguishing significance and radiance. Every dollar has come to us like a summer bouquet. The language employed in many of these gifts has been full of exuberance and sunshine. Pleasure has sparkled in every line. To us it has seemed, all through the winter now gone, like a constant ovation. Not a day has come without a gift. All over the continent, from Heart's Content to Vancouver's Island, the warm right hand of fellowship has been held up for a general clasp in this one filial act of honor to one on whom has fallen, here and everywhere, the name of the "Father of the Telegraph."

How gratefully the object of this universal testimonial reads the evidences of the progress of the work, we cannot tell. As he slips into our den, every now and then, to eat his midday apple, all he has to say is, "astonishing." He receives this ovation thankfully, with an humbled sense of the higher honor of having been made the medium of a great gift to man. As we write this he is passing the eightieth cycle of the years upon the dial of his life. He steps across the line of four score with a steady hand, a clear eye, and a nimble foot. You have all helped to make the day of the close of his 80th year a joy. The pleasure will return to you with added delight.

One feature of the undertaking has been exceedingly gratifying. We have yet to see the first uncourteous letter, and hear the first unkind remark respecting it. There has been no misunderstanding with artists. The work could not have gone into more capable or worthy hands than the young artist, Byron M. Pickett, who designed and executed the statue. To our mind it is the finest yet erected in America. Others may object to this, but such is our thought. It is a statue faithful in its portraiture, exceedingly natural and reposeful in its attitude, and yet full of force and of quiet grandeur in all its lines. We are entirely satisfied with the artist's work. The casting, we are convinced, will be equally successful.

We confess to a feeling of great desire that the inaugural ceremonies be held on the anniversary of the day which the statue so directly commemorates. There had been some doubts expressed as to the actual sending of the first message over the first completed line, but the receipt of the following, written after an examination of the original message, now in the Cabinet of History in Wadsworth Athenæum, Hartford, Connecticut, has put at rest all doubts on the subject:

5 WEST 22D STREET, N. YORK,
21st April, 1871, 5 P. M.

Dear Mr. Reid:

I have just received a telegram from Hartford, which gives the date written by me on the *first dispatch* on the *first completed line* of telegraphs,

"24TH MAY, 1844, AT 8:45 A. M."

This settles the date.

Truly your friend,

SAML. F. B. MORSE.

It will be a very happy circumstance if the inaugural ceremonies can be had on the anniversary of that day.

In an interview with Hon. A. Oakey Hall, Mayor of the city of New York, that gentleman has, in the kindest manner, signified his satisfaction with all arrangements thus far made. Judge Hilton, Vice-President and Treasurer of the Park Commissioners, has, with his well known taste, selected for the site the choicest spot in the beautiful grounds near the esplanade of Central Park, and the base is already erected and ready for the statue. The New York City authorities have encouraged the testimonial in every way, and the statue will soon be presented to them for their perpetual care.

Any money hereafter received will be credited as before, and used for contingencies which may, and are pretty sure, to arise, and all of which will be duly reported.

As we close this article we are visited by Mr. Power, of the National Art Foundry, who says that until the castings are actually made, no definite assurance of being ready at a definite day can be given. Notice will be sent by telegraph, over all the lines, at the earliest day possible. The peculiar arrangement of costume on the statue renders the work of casting exceedingly slow and difficult.

THE ATLANTIC CABLES.

In a few days the steamer Schanderia will leave England to repair the two Atlantic cables which have remained so long idle. At the same time 100 miles of heavy shore end will be laid in connection with one of these, so as to connect in deep water, beyond the abrupt descent from shallow water, where the injuries have been received which rendered them useless. About the same time also a steamer will proceed from Ashpee Bay to repair the cable of the Newfoundland Company between that place and Port au Basque, which was broken a week or two ago. These repairs made, the three wires to Europe will be complete.

It is a remarkable fact that the French cable has steadily performed its work, and transmitted, day by day, with comparatively little delay, the large business entrusted to it. Now that three cables will be at the public service, there is, with the triple road, the opportunity for a vast accession of business to that now done, before their full capacity is reached.

◆

The importance of accurate information, on all points connected with telegraphic enterprizes, is so acknowledged that we gladly publish the following correspondence and direct attention thereto:

NEW YORK, 19th April, 1871.

My Dear Mr. Reid:

Annexed I hand you copy of a letter written by me this day to Professor Morse, in response to enquiries made by him of me.

As it contains some important information in regard to long submarine lines, I thought it would interest you.

I remain, very truly your friend,

CYRUS W. FIELD.

NEW YORK, NEWFOUNDLAND AND LONDON TELEGRAPH CO.,
NEW YORK, 19th April, 1871.

My Dear Professor Morse:

I have the honor to acknowledge the receipt of your letter of the 5th instant, in which you ask me certain questions; and herewith, reciting them in order, I give you attached to each the reply:

Q. What is the date of the successful laying of the first Atlantic cable between Great Britain and America?

A. August 5th, 1858. This cable ceased to work on 1st September of the same year, during which time there were transmitted through it exactly 400 messages.

Q. What is the date of each subsequent cable between Europe and America?

A. Second cable, between Ireland and Newfoundland, completed July 27, 1866. Third cable, when about two-thirds laid, was lost on 2d August, 1865; recovered on 2d September, 1866- and completed on the 8th of that month. Fourth cable, —— Brest to Duxbury, via St. Pierre, was completed July 23, 1869.

Q. What number of messages, for the public and the press, were sent on these lines during the last month?

A. Total number of messages sent and received across the Atlantic in the month of March, 12,647, or an average of a little less than 405 per day: of which there were transmitted for the whole press of America 857, about 28 messages per day, rather less than 7 per cent. of the whole number. All messages for the press, containing political and general news for publication, are transmitted at half the usual tariff.

Q. How far to the East have we now telegraphic communication?

A. To Singapore. The line from there to Hong Kong is to be laid next month, and to Australia, from a point on the line to China, in November next.

Q. Are the existing cables remunerative?

A. The business between Europe and America is controlled by the three following companies, working in concert. They paid to their shareholders, during the last year, dividends on their capital as follows:

The New York, Newfd., and London Tel. Co., 7 per cent.

The French Cable Company, 7½ per cent.

The Anglo-American Tel. Co., 9 per cent.

None of these companies laid aside, during this period, any reserve fund for renewals or repairs. I think they should first reserve at least 5 per cent. per annum as a fund for that purpose. Had they done so for the last year, they would have paid dividends to their stockholders of from 2 to 4 per cent., certainly too small an interest to receive on such risky property as cables at the bottom of the Atlantic.

It is a remarkable fact that none of the long deep sea cables have ever yet earned sufficient money, in any one year, to have paid the lowest premium demanded by underwriters to insure their continuous working through that period.

With great respect, I remain,
My dear Professor Morse,
Very truly your friend,
(Signed) Cyrus W. Field.

◆

The New York, Newfoundland, and London Telegraph Co. has declared its usual quarterly dividend of 2 per cent., payable on the 15th inst.

◆

W. G. Brownson, of Wellsville, O., has been appointed Supt. of the Telegraph Department of the Cleveland and Pittsburgh Railroad.

◆

Henry Weaver, Esq., General Manager of the Anglo-American Telegraph Co., accompanied by Captain Mayne, General Manager of the French Atlantic Cable Co., are on their way to the United States, having taken passage on the Cunard steamer Russia for N. York.

◆

District Superintendents will greatly oblige the editor of the Journal by a complete list of offices under their direction to which the paper should be sent. Omissions occasionally occur in entering from notices to the Tariff Bureau, even under the closest care, and it is desired that so far as the work of mailing and direction can be made complete, it may be done.

◆

We call attention to the advertisement of Darlings's Fountain Pen in another column. It is a great convenience, and is cheap and valuable.

We direct attention also to the advertisement of Joseph Moore & Son, Philadelphia, an old established house, who may be relied on for the quality of their goods and attention to orders.

◆

The traffic receipts on the British-Indian Submarine Telegraph Company's line amounted for the month of January to £5,462, for February to £7,419, and for March to £11,901; together, £24,782. During January and the first eleven days in February the Falmouth cable was interrupted.

◆

Advices have been received that the section of submarine telegraph cable between Hong Kong and Shanghai, belonging to the Great Northern Telegraph China and Japan Extension Company, has been successfully laid, and that the cable is now open for public traffic between those ports.

◆

A volta-electric pen has been invented, which is said to run smoothly on the thinnest or roughest paper. The improvement consists in making the penholder of two dissimilar metals, a zinc inner tube and a gold, silver, or copper outer one, and perforating the latter with a certain convenient number of holes, through which the skin of the fingers and thumb come in contact with both metals, and themselves set up the voltaic action. Should the fingers of the person be unusually dry or hard, the moistening of the holder with a little diluted vinegar or acetic acid will increase its action and bring out its beneficial influence.

◆

We have the pleasure to announce that Mr. L. G. Tillotson, for many years Telegraph Supt. of the Erie Railroad, and now well known as the head of the well known house of L. G. Tillotson & Co., New York, with characteristic liberality, has determined to charter a steamer to give an excursion to the fraternity who may be in New York to attend the inaugural ceremonies. Of this we shall have more to say hereafter. Report yourselves early.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
May 1, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since April 15, the date of the last tariff order.

Managers are hereby required to enter these changes into their tariff book as soon after the receipt of the Journal *as possible.*

NEW OFFICES.

354	Bay, St. Louis, Miss.	54	Kingston, Md., Reopened.
354	Biloxi, Miss.	328	Lauderdale, Miss., Reopened
466	Burlingame, Ks.	437	Lawson, Mo., "
94	Bradford, N.H., Re-opened.	64	Maple Hill, N. Y.
153	Big Lick, Va., "	377	Middletown, Iowa.
457	Barnard, Ks.	76	Myerstown, Pa.
76	Chickies, Pa.	398	New Memphis, Ill.
466	Carbondale, Ks.	90	No. Conway, N. H., Reopened.
59	Concordville, Pa.	354	Pass Christian, Miss.
354	Chef Menteaux, La.	354	Pass Mississippi City, Miss.
90	Conway, N. H., Reopened.	354	Rigulets, La.
397	Danvers, Ill.	190	Reading, Ks.
	Eureka, Nev., tariff same as Austin, Nev.	475	Roseville, Ks.
368	Ferris, Ill.	122	Southampton, Pa.
500	Groesbeck, Tex.	263	Shelbyville, Ky.
455	Hillsdale, Iowa.	448	Seneca, Mo.
38	Hyde Park, Pa., Reopened.	54	Westover, Md.
47	Hainesport, N. J., check Mount Holly, N. J.	488	Walkers, Mo.

OFFICES CLOSED.

Blodgett's Mills, N. Y.; Edwardsville Crossing, Ill.; Glencoe, Pa.; Johnston's Sta., Ga.; Junction Ranche, Mon.

GENERAL INFORMATION.

The following is a list of offices on the Deseret line, in Utah, with "Tariff for other Lines" from Salt Lake City, Utah. The rate for additional words, when the rate for ten words is 25 cents, is ten cents for each additional five words or less; where the rate for ten words is 50 cents, it is 20 cents for each additional five words or less:

American Fork	.25	Logan	.25	Payson	.25
Beaver	.50	Levan	.25	Parowan	.50
Cedar City	.50	Lehigh	.25	Richmond	.25
Cove Creek	.50	LittleCottonwood Mines, or Central City	.50	Springville	.25
Dry Creek	.25			Spanish Fork	.25
Ephraim	.25			Springtown	.25
Fountain Green	.25	Moroni	.25	Scipio	.50
Fairview	.25	Mt. Pleasant	.25	St. George	.50
Fillmore	.50	Manti	.25	Smithfield	.25
Franklin	.25	Nephi	.25	Toker	.50
Gunnison	.25	PleasantGrove	.25	Washington	.50
Kaysville	.25	Provo	.25	Wellsville	.25

The tariff to the following points in Kansas will hereafter be found by "square," instead of by adding to Lawrence or Atchison, as heretofore:

Manhattan, Junction City, Chapman's Creek, sq. 127.
Solomon, Abeleue, Salina, Brookville, sq. 128.
Perry, sq. 456.
Centralia, Irving, sq. 158.
Waterville, sq. 168.
Muscotah, sq. 456.
Netawaka and Wetmore, sq. 465.

Tariff to square 127, 10 cents more than to 475
" " 128, 20 " " 475
" " 158, 10 " " 465
" " 168, 20 " " 465

Business for Bear Valley, Lykens, Wiconisco, and Williamstown, Pa., in square 76, should be checked to Millersburg, Pa., and should also be checked at same rate *by such offices as have a reduced rate to Millersburg.*

Business for Darien, Ga., will hereafter leave this line at, and be checked to, Jessup, Ga.

Business for offices of the Chesapeake and Ohio line, given in Journal of March 15, '71, with Tariff for other lines from Greenbrier, W. S. S. Va., will be sent via Catlettsburg, Ky., until further notice.

Tariff to White Mills, Pa., will hereafter be same as to Hawley, Pa.

Tariff to Farmington, Conn., will hereafter be 25 and 2 from Hartford, Conn.

The office heretofore known as Aberdeen, Miss., will hereafter be known as Muldon, Miss. square 322.

Tariff to Schoharie C. H., N. Y., from Albany, N. Y., should read 50 and 4, in Journal of March 15, '71.

Tariff to Unionville, N. Y., should read 25 and 2 from *Middletown, N. Y.*, in Journal of April 15, '71.

"Half rate" business will hereafter be taken for and received from offices in squares 127, 128, 158, and 168, and also for Arkadelphia, Ark.

The tariff for other lines to Arkadelphia from Little Rock has been increased to 100 and 7.

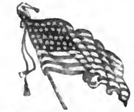
OFFICES HAVING "SPECIAL SHEET A."

Tariff to Brockport, N. Y., will hereafter be same as Albion, N. Y. Haverhill and Lawrence, Mass., and Exeter, N. H., same as Newburyport, Mass., and Myerstown, Pa., 25 cents more than "special rate" to Philadelphia or Harrisburg.

Tariff to Hyde Park, Pa., will be ten cents more than special rate to Scranton, Pa., and Chickies, Pa., ten cents more than rate to Marietta, Pa.

WILLIAM ORTON, President.

◆



THE FUND COMPLETE!

MORSE TESTIMONIAL FUND.

COMMITTEE OF RECEPTION.

William K. Applebaugh, 145 Broadway, N. Y.
Fred. T. Bickford, 11 Broad street,
Gerritt Smith, 145 Broadway.
John Horne, Jr., N. Y. Stock Exchange.
Let delegates and all comers report soon as possible.

Moses G. Farmer, Boston, Mass.	$10 00

ALLEGHANY CITY, PA.

Dear Sir:—We desire to contribute our mite for the Morse Statue. We cordially wish it success, and join with thousands of others in saying, "All honor to Father Morse." This outward honor is representative of a deeper one felt by millions, now and yet to come.

A. P. Callow, Mayor, Alleghany City, Pa.	$1 00
William Semple, dry goods, "	1 00
David Semple, " "	1 00
Jno. M. Sullivan, U S Collector, "	1 00
L. D. McCandless, Supt. Fire Alarm, Alleghany City, Pa.	1 00
J. E. B. Dalzell, iron and nails, Alleghany City	1 00
First National Bank, "	1 00
Alleghany Trust Co., "	1 00
National Insurance Co., "	1 00
Spencer, Jones, & Co., merchants "	1 00
R. Knox & Sons, produce, "	1 00
J. S. Schoonmaker, white lead, "	1 00
B. F. Pulpress (colored), fish dealer, "	1 00
Frank Krass, cattle dealer, "	1 00
Willie O. McCandless	50
J. D. Reid McCandless	50
	$15 00

Dear Sir:—I herewith send you *five dollars*, subscribed by a few friends to the Morse Testimonial.

Yours truly, Student.

Detroit, Mich., April 18.

ADDITIONAL FROM COUNCIL BLUFFS.

Operators of Council Bluffs, Iowa, through E. A. Street, Esq.

E. A. Street, W. U. Tel., Council Bluffs	$1 00
L. M. Rheam, " "	1 00
T. J. Ford, " "	1 00
W. L. Reed, " "	1 00
C. M. Chase, Great West. Tel., "	1 00
Chas. Resequie, C. & N. W. R. R., Council Bluffs	1 00
O. M. Brown, K. C. St. J. & C. B. R. R., "	1 00
E. G. Allen, " "	1 00
C. T. Barker, I. R. I. & P. R. R., "	1 00
L. E. Mosher, clerk, C. R. D. & P., "	1 00
J. Fox, C. R. I. & P. R. R.	1 00
Thomas Hines, "	1 00
	$13 00

KANSAS PACIFIC RAILWAY COMPANY.

The following is an addition to the list of Kansas Pacific Railway operators subscribing to the Morse Testimonial.

Yours, respectfully,
O. H. Dorrance, Supt.

C. R. Vestal	$2 00	G. E. Higday	2 00
C. D. Ellis	1 00	J. B. Kelly	1 00
W. B. Baldwin	1 00	J. Q. Tyler	1 00
B. Taylor	1 00	J. E. Crooks	1 00
J. J. Burns	1 00	W. H. Fanning	2 00
G. W. Cook	2 00		
D. F. Lange	1 00		
			$16 00

PACIFIC AND ATLANTIC TELEGRAPH CO.

We, the undersigned, employees of the Mississippi Division of the Pacific and Atlantic Telegraph Co., subscribe the amounts set opposite our names, as our mite to the fund for the

STATUE TO PROFESSOR MORSE,

the inventor of the American system of telegraphy:

Chas. H. Haskins, Supt., Chicago, Ill	$5 00
H. R. Myers, "	2 00
W. C. Long, "	1 00
B. C. Minor, "	1 00
E. J. Rudd, "	1 00
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F. D. Giles, "	1 00
Thomas Barnard, "	1 00
John J. Ryan, "	1 00
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D. S. Anderson, "	1 00
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W. H. Baggs, "	50
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Robert Brent, "	25
R. J. Murphy, "	1 00
Martin Foy	25
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J. Woods Elliott, Hannibal, Mo	1 00
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Wm. Rice, Keokuk, Iowa	50
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W. J. Ungles, Jr., Keithsburg, Ill	50
Fred. Clark, New Boston, Ill	1 00
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T. W. Trimble, messenger, "	25
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John Criswell, Bellevue, Ia	50
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J. C. Wilson, repairer, "	50
A. S. Schneider, Guttenberg, Ill	1 00
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W. F. Purdy, repairer, "	50
Jno. M. Carnohan, La Crosse, Ill	50
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J. A. Stanfield, Wabasha	50
E. F. Dodge, Lake City, Minn	1 00
Libbie E. Youmans, Red Wing, Minn	1 00
Marilla Blanchard, Hastings, Minn	1 00
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Jos. Harris, "	50
Frank Watson, "	50
L. C. Carpenter, "	50
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Laura Coates, Winona, Minn	25
J. O. Jeffries, Galena, Ill	1 00
Geo. M. Porter, manager, Galena, Ill	50
E. R. Swearingen, Darlington, Wis	1 00
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L. Pennington, Mineral Point, Wis	1 00
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H. D. Sloat, Rockford	1 00
A. McFadden, Belvidere	1 00
J. P. Daniels, Elgin, Ill	1 00
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Homer L. McMeans, operator, "	1 00
Patrick Murphy, messenger, "	25
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B. F. Larsh, manager, Eaton, O	1 00
	$65 50
Draft	20
	$65 30

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A. Q. Casselberry, asst. gen. supt. "	2 00
Geo. A. Hamilton, Pittsburg, Pa	3 00
O. C. Camp, "	2 00
Olin W. Hamilton, "	1 00
Richard W. Ledwith, "	1 00
Miss Maggie Alter, Cookstown, Pa	1 00
R. E. Taney, Hancock, Md	1 00
John T. Voorhees, Dayton, O	1 00
	$82 30

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W. H. Gove	1 00	Annie Drovin	1 00	
J. Groff	1 00	C. F. Habliston	1 00	
W. H. Dillon	1 00			12 00
Total				$94 30

The remittance from the Lake Shore and Michigan Southern R. R. Telegraph, credited as $50.50, should have been $59.50. The names of contributors will be published as soon as they reach us.

Here comes a welcome contribution from our old original stamping ground. How many a weary step we have taken along the rail between West Philadelphia and Columbia.

PENNSYLVANIA RAILROAD TELEGRAPH.

Dear Sir:—It gives me pleasure to remit the enclosed amount, with names of subscribers to the "Morse Testimonial." That no shadow may come to mar the complete success of the movement is the fervent wish of all, and

Yours, fraternally,

Eug. S. Gove, Div. Opr.

Eug. S. Gove, div. oper., West Philadelphia	$3 00
H. Fondersmith, operator, "	1 00
Jno. P. Boyd, operator, "	1 00
J. N. Lytle, operator, "	1 00
A. R. Heston, operator, "	1 00
Hugh Brady, operator, "	1 00
Wm. H. Conn, ex-operator, "	1 00
E. Sydney Phelps, ex-opr., "	1 00
Miss E. C. Alloway, operator, Philadelphia	1 00
Ed. G. Reese, operator, Mantua	1 00
Frank C. McGonegal, operator, Mantua	2 00
Michael Hart, operator, Overbrook	1 00
J. N. Marshall, operator, Bryn Mawr	1 00
Miss Anna M. Bloomer, operator, Eagle	2 00
Wm. D. Black, operator, Paoli	1 00
Chas. A. Colfelt, operator, W. C. Intersection	1 00
R. Cooper, operator, Downingtown	1 00
H. Keneagy, operator, Downingtown	1 00
E. Thompson, operator, Parkesburg	1 00
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B. G. Galbraith, operator, Columbia	50
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Benj. A. Lichty, operator, "	50
Saml. J. Shaffner, operator, Wrightsville	1 00
S. J. Owens, operator, Mount Joy	1 00
H. T. Shultz, operator, Elizabethtown	1 00
J. H. Stoll, operator, "	1 00
H. G. Carnes, messenger	50
	$30 00

Sleepy Hollow, April 22.

Dear Sir: Enclosed please find $5 toward the Morse Testimonial Fund.

"Father of all the Telegraphs," of thee we say,
That the great sun which rules each coming day,
As round the world it hastens in its course,
Gleams on earth's wires the well loved name of "Morse."
Come, then, ye people whom his skill hath blessed,
To him be now your gratitude expressed;
And you, ye workers of the electric fires,
Sending the world's wants out on the mystic wires,
Hark ye all now, and meet the generous call
To "hang his likeness on the earth's green wall"
Ere night's dark shadows settle o'er his eyes,
And he be gone to glory in the skies.

RIP.

WESTERN NEW YORK.

A. J. Jarvis, Cortland, N. Y	$1 00
W. H. Cozzens, Union Springs, N. Y	1 00
Miss A. A. Richards, Skaneateles, N. Y	1 00
Homer Gove, Whitney's Point, N. Y	1 00
Miss A. C. Emerick, Jordan, N. Y	1 00
Miss Crissa Sinsabaugh, Aurora, N. Y	1 00
D. E. Partridge, Seneca Falls, N. Y	1 00
L. C. Partridge, " "	1 00
W. L. Ives, " "	1 00
Miss Minnie C. Pierson, Newark, N. Y	1 00
J. C. Cummings, Syracuse, N. Y	1 00
Bob, " "	50
Bolliver, " "	50
Harvey, " "	50
P. Kelly, " "	50
	$13 00

PENNSYLVANIA.

We are glad to receive from Mr. S. L. Gilson, Manager Pittsburgh, Pa., the following closing subscription to the Morse Testimonial Fund:

M. H. Atherby, Paxton House, Pa	$1 00
S. S. Spaulding, Hydetown, Pa	1 00
A. J. Hamilton, Spartansburg, Pa	1 00
Orin Jenks, National Wells, Pa	1 00
C. H McConnell, Pittsburgh, Pa	1 00
D. E. Arnold, Venango City, Pa	1 00
W. H. Hotham, " Pa	1 00
R. E. Corey, Emlenton, Pa	1 00
W. A. Hamilton, Foster, Pa	2 00
Jacob Hodill, Phillipsburg	1 00
G. W. Reynolds, Kittaning, Pa	1 00
N. G. Wattson, Hillville, Pa	1 00
Miss L. E. Hogan, P. R. R., Pittsburgh, Pa	1 00
Miss M. D. Dover, " "	1 00
Miss M. C. Hogan, " "	1 00
Robt. P. Lowe, " "	1 00
James Hamilton, " "	1 00
David Shook, " "	1 00
A. H. White, " "	1 00
M. J. Reeves, " Altoona, Pa	1 00
Robert Haines, messenger, P. R. R. Pittsburgh, Pa	25
	$21 25

LACKAWANNA AND BLOOMSBURG R. R. TELEGRAPH.

Dear Sir: Enclosed find list of operators on the Lackawanna and Bloomsburg R. R. subscribing to the Morse Testimonial Fund. Every office is represented.

Respectfully yours,

J. M. Nicholson, Ch. Opr.

J. M. Nicholson, ch. operator, Kingston, Pa	$1 00
A. S. Potter, night train dispatcher, Kingston, Pa	1 00
T. E. Ellis, operator supt's. office, Kingston, Pa	1 00
C. Wiggins, repairer, Kingston, Pa	1 00
C. F. Sutherland, operator, Pittston, Pa	1 00
G. H. Sutherland, operator, Pittston, Pa	1 00
L. Welch, operator, Pittston, Pa	1 00
M. Sax, operator, Wyoming, Pa	1 00
S. P. Shafer, operator, Plymouth Junction, Pa	1 00
F. Schneider, operator, Plymouth, Pa	1 00
J. McFarlane, operator, Nanticoke, Pa	1 00
A. D. Hicks, operator, Hemlocks Creek, Pa	1 00
W. B. Poust, operator, Shickshinny, Pa	1 00
D. W. Campbell, operator, Hick's Ferry, Pa	1 00
J. A. Bellis, operator, Private Line, Hick's Ferry, Pa	1 00
W. G. Driesbach, operator, Beach Haven, Pa	1 00
B. R. Davis, operator, Berwick, Pa	1 00
J. M. Lilley, operator, Espy, Pa	1 00
W. O. Holmes, operator, Bloomsburg, Pa	1 00
G. W. Mears, operator, Rupert, Pa	*1 00
W. H. Rote, operator, Danville, Pa	1 00
C. Van Buskirk, operator, Danville, Pa	1 00
R. G. Scott, operator, Northumberland, Pa	1 00
	$23 00

*Acknowledged before, but wants to be in with the rest.

H. Waite Burr, Bay Shore, L. I., N. Y	$1 00
J. V. Gishwiller, Tonica, Ill	1 00
W. M. Lewis, Shellsburg, Iowa (second sub.)	1 00
John B. Parkins, operator, Council Hill, Ill	1 00
E. B. Halsey, agent K. C., St. J. & C. B. R. R	1 00
S. W. Keeley, operator, " "	1 00
Frank J. Lynch, manager, Waterford, Pa	1 00
Miss Nennie Arnold, Clyde Depot, N. Y	1 00
Miss Kittie Keeler, Lyons, N. Y	1 00
Charles Marsh, Brunswick, Mo	1 00
Samuel D. Porter, Buffalo, N. Y	5 00
B. F. Woodward, Denver, Cal	5 00
E. Winter, manager, Kingston, N. Y	2 00
A. F. Cornell, Redwood City, Cal	2 00
J. H. Stewart, operator, Kingston, N. Y	1 00
A. J. Allen, operator, L. C., L. R. R., Cincinnati, O	1 00
Mary E. Bell, Williamsburg, N. Y	1 00
T. P. Wheeler, manager, Menlo Park, Cal	1 00
R. M. Barnwell, Dongola, Ill	2 00
H. M. Bennett, manager, Mayfield, Cal	1 00
Chas. Lehr, Bremen, Ind	1 00
S. B. Culver, Sandy Hill, Wash. Co., N. Y	1 00
Andrew Young, Honeoye Falls, N. Y	1 00
T. L. Culver, surveyor's office, C. H., New York	1 00
Henry L. Rooke, manager, Indianola, Texas	1 00
T. Whitaker, manager, "	1 00
L. R. Curtis, Galveston, Texas	1 00
John H. Purdy, Middletown, N. Y	2 00
W. P. Smith, Artesia, Miss	1 50
George W. Taylor, operator, Fort Fetterman, N. Y	1 00
"M.," Danbury, Conn	1 00

THE KEYSTONE.

L. C. Orvis, manager, Manchester, Vt	2 50
George Little, Rutherford Park, N. J	5 00

We omitted the acknowledgment of the following:

Abram S. Hewitt, Esq., New York	$50 00
E. H. Von Kleeck, Esq	30 00

and have now to acknowledge reception of checks from the following gentlemen to close the fund:

Augustus W. Greenleaf, Esq., N. York	$25 00
Hon. E. D. Morgan, N. York	25 00

The reception of the foregoing provided for all bills which we had contemplated in connection with the work, but the following gentlemen have voluntarily added to the fund to provide for contingencies as follows:

J. H. Banker, Esq., N. York	$25 00
Augustus Schell, Esq., New York	25 00
John Steward, Esq., New York	25 00

So that more money has been placed in our hands than we asked, yet which we begin to see will all be needed, however carefully future arrangements may be made.

Friends, we congratulate you all on this gratifying result.

◆

TELEGRAPHERS' LIFE INSURANCE ASSOCIATION.

ASSESSMENT No. 20.—RECEIPTS.

254	294	291	311	354	357	359	360	362	366
366	392	575	606	632	635	918	946	966	1067

No. 19. 602.

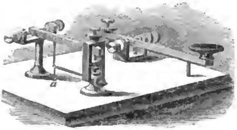
◆

MARRIED.

Brankam—Mitchell.—On the 5th instant, at the residence of the bride's father, by the Rev. A. M. Richardson, Mr. Orlando Brankam, agent Kansas Pacific Railway and operator W. U. Tel. Co., Stranger, Kansas, to Miss Cassie E. Mitchell, of the same place. The handsome bridegroom and fair bride left for an extended tour in the East, with the best wishes of a host of friends.

MECHANICAL TELEGRAPH INSTRUMENT,

PATENTED MAY 31st, 1870.



For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

This instrument is an outgrowth of this pressing demand. The Inventor is himself a practical operator, now in active service. Operators and others wishing to teach or learn the Art, will be delighted with this instrument.

It can be placed anywhere, as it does not occupy a space more than six inches square. A card with the Telegraph Alphabet, Numerals, &c., attached to each instrument.

Its cost is but $7, and there is no expense whatever to keep it constantly in working order.

We will send a copy of SMITH'S MANUAL, free of charge, with each instrument, to individuals or clubs.

Any person selling ten or more of the instruments, will be allowed ten per cent. commission, sent C. O. D., or on receipt of price.

Special and liberal terms to manufacturers.

To save expense of returning funds by express, remittances can be made by draft on Cleveland or Pittsburgh, or by Post Office Order, in which case no charge will be made for box. Price $7. Silver-plated, extra finish, $10.

Parties ordering Instruments, except from well-known cities, will please give name of county and State.

Address, D. W. PUTT & CO.,
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These Holders will be sent by mail, post-paid, on receipt of the price, on the following terms:

Cedar Holders, for Desk		$0 50
Ebony " "		0 60
Cedar " "	Ex. Plated	0 75
Ebony " "	Nickel Plated	1 00
Pocket Holders, Plain,	" "	1 75
" " Chased,	Ex. Plated	2 00
Six Cedar Desk Holders to one order		2 00

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NEW YORK, March 15, 1871.

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FRANK L. POPE,
Associate Editor of the "Telegrapher."

NEW YORK, April 21, 1871.

I fully accord to the above opinion of the Self Supplying Pen-Holder, having tested it for some time.

SAMUEL F. B. MORSE.

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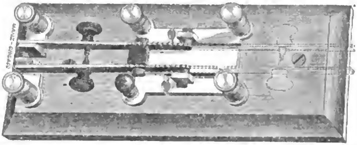

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For the accommodation of the

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both plain and Galvanized, in Bond, ready for shipment from New York.

PRICES AS FOLLOWS:

No. 9, Plain Annealed	4½ cts. Gold.
No. 9, Galvanized	5¼ "
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This Brand of Wire is the best in the world, and has been adopted exclusively by the Western Union and many other Telegraph Companies.

We also continue to import this Wire for use in this country, notwithstanding the high rate of duty imposed by Congress in the interest of the monopolists. Any amount of it can be seen at our store at all times. The import duty on wire is now two cents per lb. gold, and 15 per cent. *ad valorem*.

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Mutual Life Insurance Association.

INCORPORATED UNDER THE LAWS OF THE STATE OF NEW YORK.

I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and th payment of dues

XI. A meeting for the election of officers shall be held annually during th first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy ntil the time of the annual election.

XII. Special meetings of the association may be called upon the written reques of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer.

GERRITT SMITH, Secretary.
A. S. BROWN,
W. H. HILL,
D. R. DOWNER,
Executive Committee.

DIRECTIONS TO APPLICANTS.

1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to Gerritt Smith, Secretary Telegraphers' Mutua Life Insurance Association, 145 Broadway, New York, and a certificate of membership will be sent by return mail.

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

5. No letters can be answered unless a stamp is enclosed for postage; and as the officers labor without compensation, correspondence requiring answers should be as limited as possible.

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JOURNAL OF THE TELEGRAPH.

VOL. IV. NO. 12. NEW YORK, MAY 15, 1871. WHOLE NO. 85

LONDON CENTRAL TELEGRAPH STATION.

This building, which occupies a space of about 80 feet by 90 feet, was built by the Electric and International Telegraph Company, and by them transferred to the Post Office authorities. The station is made up of a main body and two wings, which latter were erected subsequent to the main building, and from this cause it was found impossible to utilise the whole of the space so satisfactorily as if it had been laid out on a complete scheme.

The station has three stories and a basement, and it has been entirely rearranged by the Post Office Department since it passed out of the hands of the company. In the basement are placced the engines and batteries, in addition to the storerooms. On the ground floor is a "sending-out" room, with offices and dining-rooms for the messengers and the male staff, together with the press writing-room, a surgery and consulting room, and the engineer's workshops. The first floor contains the offices for the engineering staff and the superintendent, with a dining-room and kitchen for the female staff, and the matron's office. The second and third floors are entirely devoted to the business of the establishment, the second floor being known as the Metropolitan Gallery, and the third floor as the Provincial Gallery. Accommodation is also given on the ground floor, and on the first floor, to the Anglo-American and to the Indo-European Companies, who occupied a part of the building before the date of the transfer. The second floor contains 176 instruments, of five different kinds, namely:

Morse printers	84
Single needles	76
Bright's bells	11
A B C's	4
Double needles	1
	176

These are in communication with all the offices in the metropolitan districts, extending as far as Windsor, and include instruments devoted entirely to official or private work. Thus Buckingham Palace is represented by the one double needle instrument, the War Office, the Treasury, the Admiralty, the Horse Guards, the House of Commons, all have their instruments, so has the Langham Hotel, several of the markets, and the different metropolitan railway stations. Two out of the four A B C instruments are connected to private wires, the other two being used for the Treasury.

In the third floor, or Provincial Gallery, there are 131 instruments, of five different classes, namely:

Morse printers	66
Single needles	21
Bright's bells	13
Wheatstone's automatic	20
Hughe's Type printer	11
	131

These instruments are of course in communication with all the telegraph offices in the United Kingdom.

In this floor are also arranged the termini of the 17 pneumatic tubes laid down between the Central Station and various offices in connexion with it. Six of them are merely home tubes connecting different departments; they are placed last in the accompanying table, which gives the number and length of the pneumatic tubes worked upon Clark's system, between the Central Station and various districts, and the time occupied in the transmission of messages:

	Length of tube.	Diameter of tube.	Time occupied in transmission.			
			Pressure.		Vacuum.	
	yards.	in.	min.	sec.	min.	sec.
Fenchurch street	960	2¼	1	5	1	20
Leadenhall street	659	2¼	0	35	0	38
Baltic Coffee House	500	2¼	0	25	0	38
Gresham House	588	1½	0	40	0	51
Threadneedle street	566	2¼	0	34	0	48
Threadneedle street	559	2¼	0	32	0	45
Cornhill	490	1½	0	37	0	40
Old Broad street	370	1½	0	25	0	29
Lloyd's	343	1½	0	17	0	25
Stock Exchange	314	1½	0	15	0	15
Founder's court	228	1½	0	13	0	14
Anglo-American Office	62	2¼	0	5	0	6
Indo-European Office	57	2¼	0	5	0	5
Engineer's Office	50	2¼	0	4	0	5
South Gallery	50	2¼				
Intelligence Depart.	44	1½	0	5	0	6
Metropolitan Gallery	20	2¼	0	5	0	4
Total length	5,974					

An engine of 40 horse power is employed to work these tubes. In addition to the ones above enumerated, are two double tubes upon Messrs. Siemens and Halske's system, connecting the Central Station with the General Post Office, and with the Temple Bar Office, and the extension to Charing-cross is either finished or on the point of completion. The diameter of these tubes is 3 inches; the length of the first named is 852 yards, and that of the second, 1,383 yards of double tube.

Together they form a double pneumatic railway, with termini at the Central Station and at Temple Bar, with an intermediate station at the General Post Office, and the arrangement is such that the despatch carriers, which have a capacity of 50 messages, can be transmitted direct throughout the whole line, or stopped at the intermediate station by switch boxes, or when a carrier is sent direct through, it may be switched out at the intermediate station for the insertion of messages without causing much delay. The time required for traversing the whole distance is, when vacuum and pressure are both employed, 3 minutes, or 5 minutes with vacuum only. A regular system of telegraphic signalling is employed in working these tubes, Tyer's patent apparatus being used for the purpose. By these double tubes the work of 5 wires and of 12 clerks is performed; indeed Mr. Scudamore states that it would be impossible to transact the business of the day without the pneumatic system.

All these tubes are upon Clark's system. In Dublin three tubes, one of 1,530 yards in length, and two of 700 yards each, are in course of construction.

But a small proportion of the business of the Central Station consists in the delivery of messages. Some despatches are of course received for delivery within a limited area, and during the night the office is open to the public for the collection of messages, but the real business of the station lies in the receipt of messages for re-transmission, so that it serves as a forwarding office. With such an enormous amount of business, which is thus thrown upon the hands of the operators, it is easy to understand how greatly matters are expedited by means of the pneumatic tubes, which communicating with the most important offices, the Post Office, Temple Bar, and Charing-cross, as well as with the principal centres of business in the city; serve as a means of sending from 8 to 50 despatches at one times, and with the slight delay shown in the foregoing tables. So soon as the tube carriers arrive at their destination in the Central Station their contents are sorted on tables in the Provincial Gallery, and dealt with according to their destination, whether for the metropolis, for the country, or for abroad. If this be London or the environs, the messages are forwarded into the Metropolitan Gallery, if they are for the country they remain on the same floor, falling into one of the four departments, corresponding with the four great circuits into which the district of the United Kingdom is divided. American telegrams are despatched to the offices of the Anglo-American and French Atlantic Companies within the building, so with the Indian telegrams, which are sent to the Indo-European Company's office, or to that of the British Indian Submarine Company.

The four grand divisions into which the provinces and the metropolis are divided, are served by nearly 300 wire circuits working from the Central Station, and these are connected with some 115 metropolitan and 190 provincial stations. In all cases the circuits serving the different towns or districts are grouped together, so that an equal division of labor can be thrown upon each circuit by the clerks in charge.

A careful record of the number of messages received and retransmitted is kept, so that a complete system of check is maintained, and the results of each day's performance are carefully recorded.—*Engineering.*

◆

ABSOLUTE TEMPERATURE.

By the Rev. H. Highton, M. A.

1. The doctrine of the Mechanical Equivalence of Heat has involved the necessity of imagining an absolute zero of temperature—that is, a point below which cold cannot go, and at which there is an absolute deprivation of all heat.

2. This absolute zero is arrived at in the following way: It is said that air for every degree of temperature loses 1-274th part of the volume it had at the ordinary freezing point of water; and, therefore, that at the temperature—274°, it will cease to have any volume at all, or, as it is more euphoniously expressed, in order to avoid the obvious absurdity, it would cease to have any elastic force. Hence, it is gravely assumed in our fashionable modern books of

science, that — 274° is the deprivation of all heat and that the amount of absolute heat in a body is measured by its temperature above — 274°. Thus it is proved that a pound of water at ordinary temperatures contains within itself heat capable of raising it at least 80 miles. Well may Tait, in his "Thermodynamics" (p. 21), call this one of the most extraordinary results of physical science!

3. But, unfortunately, if we take water as our standard, absolute zero would be totally different. Applying the same arguments to water, we might if we reasoned from certain temperatures above the point of maximum density, make absolute zero of temperature about —2800°; and from others below the maximum density, the zero of cold beyond which heat could not be raised would be +6450°! Iron, mercury, and other bodies, would each give different zeros. The fact is, it is assumed that the same, or nearly the same, rule which applies to gases at some temperatures applies to them at all, and that they could never be liquefied.

4. To suppose an absolute zero of temperature appears to me as utterly absurd as to suppose that negative electricity could go on increasing in intensity till no positive electricity at all was left and there was an absolute zero of electricity. Heat, like electricity and motion, is relative, not absolute. It is positive, when it bears a certain relation to the state of things around it; negative, when it bears an opposite relation. Of absolute electricity we know nothing; but we assume, as our starting point, a state of equilibrium in neighboring matter. So of motion; till we can find a point of absolute rest, we know only nothing of absolute, but only of relative motion. So in heat; our true starting point of zero can only be the average temperature of the universe, if ever that can be ascertained. Heat, motion, and electricity are all dual, not single forces; and it is from overlooking this duality of heat that all the modern errors on the subject have sprung. It is not so many years since, that when Mayer first propounded the theory of the Mechanical Equivalence of Heat, the opposition of the physicists of that day, and the difficulty he found in getting any scientific publication to print his views, actually drove him out of his senses. I can plainly see that the doctrine will be far more easily overthrown than it was established. I observe that your contemporary the *Popular Science Review*, gives a verdict that my articles in the *Chemical News* have proved my point; and that the April number of the *Scientific Review* supports the case by an experiment of the simplest and most conclusive kind.

◆

THE TAILS OF COMETS, THE SOLAR, CORONA. AND THE AURORA, CONSIDERED AS ELECTRIC PHENOMENA.*

By Professor Osborne Reynolds, M. A.

Part II.

In the paper which I read before this society, on the 29th of November last, I endeavored to show that it is probable that these phenomena are a species of that action known as the electric brush taking place in the medium which fills space, be it ether or simply gas, or both. The reasoning I made use of was, essentially *a fortiori*. I pointed to the fact that the electric brush as seen in the Geissler tubes exhibits similar appearances, and that at the times of greatest display on the part of comets and the aurora similar conditions are present, such as a change in the action of the sun, conditions which, to say nothing more, are favorable to electric disturbance. I purposely avoided all attempts to explain how the brush may be produced, feeling that it was sufficient to point to the aurora, which is universally admitted to be electrical, as a proof that such phenomena do exist even if we cannot explain how. This proof, however, is perhaps not quite satisfactory. In order that it may be complete, the other phenomena must be produced in the same way as the aurora, and this, although possible, is not necessary. An assumption which is commonly made respecting the phenomena of the aurora cannot be made with respect to the others. This assumption assigns the two magnetic poles of the earth as the two electrodes between which the electric discharge takes place, which forms the aurora borealis and the australis. If this assumption be maintained, some other explanation must be found for the manner in which electricity may form the tails of comets and the corona. It is quite clear that the tail of a comet cannot be due to a discharge between two electrodes situated on the comet itself. In the same way, from the position occupied by the corona, it can hardly be due to electricity passing between two electrodes on the sun. In fact, if a comet's tail is electrical, it is due to a discharge of electricity of one kind or another from the comet, which, for the time, answers to one of the electrodes only. The same may be said of the corona and the sun. If we could observe the aurora from a point distant from the earth, it is very probable that we should find the same to be the case, but whether this would be so or not, an assumption has been made as to the cause and nature of the aurora, which will answer just as well for the corona and comet's tails; it is that the sun, acting by evaporation or otherwise, causes continual electric disturbance between the earth and its atmosphere, the solid earth being negatively charged and the atmosphere positively, and that the aurora is the re-union of these electricities taking place in the atmosphere.

Now, as has been already said, this assumption will serve for the comets and the sun as well as for the aurora. If there is a continual electric disturbance between the sun and the medium in which it is placed, so that the sun becomes negatively and the medium positively charged, the re-union of these electricities would form the corona. It must not be supposed that I assume the sun to be a reservoir of electricity which it is continually pouring into space. I consider that the supply of electricity in the sun is kept up by some physical action going on between the sun and the medium of space, whereby the sun becomes negatively charged, and the medium positively.

This may be well illustrated by reference to the common electrical machine; here the motion of the glass against the rubber causes the glass to become positively and the rubber negatively charged; and these electricities do not unite instantly there and then, but remain and accumulate in the respective bodies, until collected and brought together again by the conductor.

Assume, then, that the sun is in the position of the rubber, while the ether is in that of the glass; then the corona corresponds to the spark or brush which leaves the conductor. On the same assumption, the negative electricity of the comet would be more and more set free by the inductive action of the sun as the comet approached it, and would also be driven off by induction in a direction opposite to that of the sun; and combining with the positive electricity in the ether would form the tail of the comet, in a manner analogous to that in which a negative spark is given off by the lid of the electrophorus.

I think that a rational account may in this way be given of the manner of the electrical action to which I have attributed these phenomena, but I do not consider that the probability of the truth of this electrical hypothesis depends on the value of such an explanation. It is an assumption based on the manner in which it fits into its place, and explains the appearances presented by these beautiful phenomena.

Since this paper was written, my attention has been called to the fact that Mr. Richard Procter has published views of these phenomena which somewhat resemble mine. He attributes them in part to electricity and in part to meteors. There is, however, this fundamental difference between our views, that he considers the tails of comets as consisting of cometary matter, the difficulty of conceiving which was the origin of these speculations. Moreover, I can conceive no electric discharge between two meteors without a medium between them, and if there is a medium, why is there any necessity for meteors? If, as I see good reason to suppose, gas, when glowing with electricity, reflects or scatters rather than absorbs light of the wave-length which it radiates, that portion of the coronal light, which is polarised and assumed to be reflected, will be accounted for. I think that the recent observations have confirmed the probability of these speculations, inasmuch as they have confirmed the facts on which these speculations were based. There is one point which has not been already noticed, but which seems to me to be of some importance.

If the corona be an electric discharge, the electricity will be continually carrying off some of the elements of the sun into space where they will be deposited and condensed. May not this stream of matter be the cause of the existence of small meteors, and supply the place of those which continually fall into the larger bodies?

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* Read before the Manchester Literary and Philosophical Society, February 7, 1871.

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THE CHRONOPHER.

"Greenwich time" is kept all over England and Scotland by all the railway, post-office, church, and watchmakers' clocks. The time is sent daily, at 10 o'clock, from Greenwich Observatory, all traffic over telegraph wires used for the purpose being suspended at 9:58. Sixteen of the most important cities are in direct communication with Greenwich, and places through which the wires pass are aware of the completion of the circuit which announces 10 o'clock. The principal London watch and chronometer makers, such as Dent, Vulliamy, Barraud, Walker, Frodsham, and others, are communicated with even more frequently. Guns are fired at the ports of New Castle and Shields at 1 o'clock daily by the same means. The clock at Greenwich, which automatically sends the time, is called a chronopher, and is corrected to a variation of a twentieth part of a second in a week.

This is a useful arrangement in England, where the country is so small that one uniform time can be kept without varying more than a few minutes from solar time, even in the most distant cities. But it could not be practised in the United States. No assimilation over a part of the country would do anything but confuse and perplex the public; and if the clocks of San Francisco kept New York time, they would vary from solar time by a difference of more than three hours.

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Electrical Gas Lighting and Extinguishing Apparatus.—John Vansant, San Francisco, Cal.—This invention has for its object to produce an apparatus by means of which gas can be lighted and extinguished on a suitable number of burners in rapid succession, and without requiring the handling of, or personal contact with, each burner or its gas pipe. The invention consists in the application to each gas pipe or burner of an electric apparatus, by means of which the valve, for admitting the gas to the burner or withholding it from the same, will be opened or closed whenever the currents are directed in the appropriate manner.

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The traffic returns in the Great Northern Telegraph Company's lines for the month of March showed that there were 19,712 messages of 20 words on the Danish-English line; 8,562 messages of 20 words on the Danish-Norwegian line; 8,574 messages of 20 words on the Danish-Russian line; 793 such messages on the Moen-Bornholm line; 8,308 such messages on the Norwegian-Scotch line; and 2,081 such messages on the Swedish Russian line—total, 39,943 messages of 20 words, and the estimated revenue 110,171f. (£4,431.) The total receipts for the first quarter of 1871 amounted to 268,224f. (£10,729), for 94,181 messages; and for the same period in 1870 to 174,636f. (£6,985), for 63,166 messages, showing an increase of 31,458 messages, and 93,592f. (£3,744.)

LEGS AND FISH.

Mr. Sargood.—Having given us the position of the telegraph offices in relation to railways and towns abroad, do you find a great contrast when you come to England in that respect?—In the United Kingdom the greater number of offices are, and long have been, at the railway stations; and the charge for transmission of messages to the offices at such stations is very frequently increased by the charges for porterage out of the free delivery; they do not carry the message so far by wire as the continental administrations do; they have to carry it further on human legs, and, therefore, the charge for porterage is somewhat higher.

Your idea, if these matters should fall into the hands of the Post-office, is to carry your wires so near to the people that those difficulties will be overcome?—We should endeavor to use legs as little as we possibly could.

You say as little as possible, but you do not mean to dispense with legs?—I am afraid, in the present state of the world, we must use legs to some extent.

The published rates for transmission, I think, in this country, are generally those for the conduct of the messages over the wires?—Yes, and within a limited free delivery.

Do they afford a fair approximation to the cost of the telegraphic message, bearing in mind that very much has to be supplemented by legs at an extra cost?—No, they do not. I can give some illustrations of that. For instance, there is apparently a sixpenny rate for transmission in some large towns, but the dispatching and receiving offices are so few in number in those large towns, and consequently so far distant from the bulk of the population, that a sixpenny rate can hardly be said to have a practical existence; whilst the time occupied in transmission is so great that the Post-office sometimes, and a private messenger almost always, can do the work more quickly.

That being a general observation, applicable to everybody and everything, perhaps you can give us some local illustrations; have you made any experiments with messages?—Yes, after the debate in the House of Commons on the second reading, when the question as to a sixpenny rate in town was raised, I sent some experimental meseages; in Birmingham, for instance, I sent ten messages to different parts of the town and its immediate suburbs; in five cases the charge, including porterage, was 1*s.* 6*d.*; in two, 1*s.*; and in three cases, in which 6*d.* only was charged, the postmaster informs me that, to the best of his belief, the messages did not pass through the wires at all, but were sent at once by hand to their destination.

* * * * * * * *

Can you bring us a little nearer home, and give us a little London experience?—In London I sent messages from the city to Camberwell, Kensington, Norwood, Lee, and Hampstead. In no case was the case was the total charge less than 1*s.* The telegram to Lee, near Blackheath, cost 2*s.*; and the Post-office messenger, after depositing it at the telegraph office, went down to the place of destination by railway, with a return ticket, which cost him 1*s.*, and he arrived twenty minutes before the message did.

How did Kensington fare?—The message to Kensington cost 1*s.*, and occupied fully two hours in transmission.

That is worse than the omnibus, I think?—Yes. The message to Hampstead cost 1*s.* 3*d.*, and occupied nearly three hours in transmission.

Mr. Hope Scott.—I suppose you abused the companies pretty freely for that?—We do not abuse them at all; I do not ascribe it to any fault of the companies.

Mr. Sargood.—It is rather a weakness than a vice?—But it is a weakness which does not lean to virtue's side.

I suppose between large towns messages may be transmitted rapidly?—There is no sort of ground for complaint with regard to the transmission of messages between large towns, none whatever; the work is rapidly done, there is a proper force of messengers, and the messages are carried out promptly and properly.

You think that, notwithstanding the result of your experiments, the delay is not a necessary consequence of the existence of telegraph companies, and would not be a necessary consequence of the Post-office conducting the telegraphs?—Certainly not; it is really in consequence of the telegraph system having grown up mainly round the railway system. There are in the United Kingdom a great number of places which are distant four or five miles from the nearest telegraph station, which is mostly at the railway, and there are a great number of telegraph stations in the United Kingdom which are open for public business only at intervals throughout the day, and from which the messages received are sent out for delivery by chance messengers only. I may mention that only a fortnight ago I received a telegraphic message at my house which was brought by a fishmonger's boy, who had been pressed into the service by the telegraph clerk. His fish would not keep, but my message would, and therefore he delivered the whole of his fish before he delivered the message. I do not say this in disparagement of the companies at all, not for one moment.

You are merely speaking as the experience of public life?—I beg to say, once for all, that I have never concurred with those who accused them of habitual inaccuracy in the transmission of messages. I think that they have done their work uncommonly well, and in the first instance at very great pecuniary risk, and in spite of very great difficulties indeed.—*Scudamore's Report.*

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Augusta, Maine, May 5, 1871.

To the Editor of the Journal of the Telegraph:

By your request, I send you the enclosed sketch of my battery, as it now stands, and as I keep it. I forgot to mention, in my last communication, that paper operators must not expect to run their batteries with the same success that I have mine. It requires a great deal stronger battery to run a register than it does a sounder. I have another experiment to try, which, I think, will be successful. I have made me a long-handled spoon to clean out the bottom of the porous cups; by doing this two or three times I expect to run one pair of zincs until they are entirely used up. I think the dirt in the bottom of the porous cups can do no harm unless it comes in contact with the zincs, and it is only necessary to keep the dirt below them to run a battery without cleaning, as long as the zincs will last. One tea-spoon full of vitriol in each jar twice a week will run my sounder in good shape. I don't think I use as much as that, and there is no excuse for a sound operator not doing the same as I have, with the same kind of battery. I don't think that there is an operator who has read my articles who will look at a five dollar bill a great while before sending for one of these batteries. I got mine of Charles Williams, Jr., 109 Court street, Boston, Mass.

Yours, truly,

E. H. Walker, Operator.

NEW TELEGRAPHIC INSTRUMENT.

A new telegraphic instrument, a modified form of Morse's, has been patented in England by Mr. Richard Herring. Mr. Herring is the author of the articles on "Paper and Paper-hanging," in Ure's "Dictionary of Arts and Manufactures." His instrument is furnished with two keys, one to work a lever carrying a pin, to make a dot, and the other to work a lever carrying a small linear stile to make a dash.

The London *Times* says: "Greater accuracy seems likely to be secured; for it now takes a very long time to acquire the art of releasing or holding down the key with accuracy. It will be much easier to learn to use the two keys, one for the dot and the other for the dash, and to use them with the same rapidity. Mr. Herring suggests that it would be practicable to emboss two slips at the same operation, and to give one to the sender, who would thus know with certainty what message had been dispatched. The changes introduced by Mr. Herring may be almost regarded as matters of mechanical detail; but they seem likely to be of practical value and importance. To save nearly half the time now consumed in telegraphing, to give a compressed and easily legible dispatch in place of one that is always lengthy and often obscure, to make one tun of paper do the work of four tuns, and to remove a fertile source of inaccuracy, are promises, any one of which would call for careful investigation by the authorities." Such mechanism has no demand in America. The record is out of date. A good operator, with a single key, can do more, and better work, than by any such device.

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Encounter with a Burglar.—This morning, about half-past one o'clock quite a desperate encounter occurred at the residence of Mr. Nat. Hucker, Local Superintendent of the Western Union Telegraph Company, No. 60 Johnson Place, between that gentleman and a burglar, in the sleeping apartment of the former. Mr. Hucker was awakened by his wife, who said there was somebody in the room. He replied that it was probably the children moving in their beds. His wife repeated that she knew there must be some one in the apartment, a robber or some person who had no business there. Mr. Hucker turned over in bed and looked about the room, and saw the form of a man creeping on the floor between the bed and the door. At once he jumped out of bed and grappled with the burglar, seizing him by the throat. A struggle of over five minutes ensued, and Mr. Hucker, although small in stature, proved himself big in courage, and did his level best to overcome his opponent. Unfortunately the robber broke away and rushed into the parlor and jumped through the window, carrying away sash, glass and all, and thus escaped. The burglar left his hat behind him, which may lead to his identification. Mr. Hucker was struck on the forehead, received a bite on his left arm, was scratched on one of his hands, and bruised on his right leg. His hurts are not serious. The desperado escaped, as we have stated, and it is thought that he carried nothing from the house except a few good bruises which "Nat" gave him with his left duke.

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It is well known that icebergs cool the water around them to a very considerable distance. An American gentleman, named Dion, has made this fact the foundation of an invention to protect vessels against collision with icebergs. He proposes to place on the bottom of steamers or other vessels an apparatus so arranged as to sound an alarm on the instant the ship's keel enters a stratum of cold water. The invention is said to have been suggested by the supposed fate of the lost steamer City of Boston.

THE SERVICE.

WESTERN UNION TELEGRAPH COMPANY

EASTERN DIVISION.

APPOINTMENTS DURING FEBRUARY AND MARCH, 1870.

R. J. Cahill,	operator	Madison Square, New York.
Miss Carrie Gerry,	operator	145 Broadway, N. Y.
M. B. Hills,	"	Washington Market, N. Y.
G. A. Kraft,	"	Trinity Buildings, N. Y.
R. A. Stevens,	"	Mineola, L. I.
J. F. Sinclair,	"	145 Broadway, N. Y.
F. H. Siebert,	"	145 Broadway, N. Y.
Miss Ida H. White,	"	145 Broadway, N. Y.
Miss Etta T. Cook,	"	Yarmouth Junction, Me.
H. F. Doust,	"	Clinton, Me.
M. H. Vietz,	manager	Eagle Bridge, N. Y.
A. Connor,	operator	Rutland, Vt.
J. G. Owen,	manager	Saratoga, N. Y.
S. Palmer,	manager	Valley Falls, N. Y.
J. C. Morrill,	operator	East Douglas, Mass.
J. Clark,	"	Thompson, Conn.
Miss J. F. Coffin,	"	Milford, Mass.
E. R. Eaton,	"	So. Windham, Conn.
H. M. Coney,	"	Ware, Mass.
F. A. Perley,	"	Revere House, Boston, Mass.
Z. Gibbs,	"	Tremont House, Boston, Mass.
H. W. Hudson,	"	Sheffield, Mass.
Miss M. B. Hibbard	"	New Hamburgh, N. Y.
H. Keyser King,	"	Bloomfield, N. J.
Edw. L. Duffell,	"	Camden, N. J.
Miss N. Harris,	"	Dover, N. J.
W. S. Williams,	"	Newark, N. J.
J. M. Alter,	"	Perryville, Pa.
C. Clay Yeakle,	"	Philadelphia, Pa.
—— Tindle,	"	Port Clinton, Pa.
T. W. O'Brien,	"	Stroudsburg, Pa.
W. T. Hotchkiss,	"	Washington, D. C.
Elisha Davis,	"	Ellicott City, Md.
Jas. Cunningham,	"	Parkersburg, W. Va.
Miss Kate Hickey,	operator	145 Broadway, N. Y.
W. S. Langdon,	operator	Manhattanville, N. Y.
Miss Lizzie M. Noble,	operator	145 Broadway.
John E. Russell,	manager,	Bradford, N. H.
C. N. Dutton,	"	Brandon, Vt.
E. G. Mason,	operator	Rutland, Vt.
W. H. Annis,	manager	West Boylston, Mass.
William C. Coffin,	operator	South Braintree, Mass.
C. C. Abbott,	"	Holliston, Mass.
F. A. Eastman,	"	Boston, Mass.
Wm. Lombard,	"	Terryville, Conn.
Drury & Rice,	"	Milford, Mass.
Frank Sammis,	"	South Norwalk, Conn.
Miss Annie Sherman,	"	Foxboro', Mass.
Miss F. M. Porter,	"	Ft. Washington, N. Y.
Ira S. Kinch,	"	Farmer Village, N. Y.
H. F. Peet,	"	Clyde, N. Y.
Miss Anna A. Richards,	"	Skaneateles, N. Y.
B. T. Strickland,	"	Chenango Forks, N. Y.
A. W. Bowman,	"	Hackettstown, N. J.
Theo. F. King,	"	Washington, D. C.
Chas. A. Laubach,	"	"
D. Marean,	"	"
A. C. Ritchie,	"	Manchester, N. J.
Samuel B. Roberts,	"	Washington, D. C.
W. E. Shannon,	"	Scranton, Pa.
S. B. Wilson,	"	Pemberton, N. J.

TRANSFERS.

R. P. Brooks	Hoffman House, N.Y., to 5th Av. Hotel, N.Y.
G. W. Blanchard	Westchester House, N. Y., to Station H, N.Y.
Geo. J. Bascom	5th Av. Hotel, N. Y., to Gilsey House, N. Y.
R. J. Cahill	Madison Sq., N. Y., to Board Brokers, N. Y.
R. O. W. Dennison	West Bank, N. Y., to Receiving Depot, N. Y.
Miss A. B. Hibbard	145 Broadway, N. Y., to New Hamburg, N.Y.
T. E. McAllister	Rhinebeck, N. Y., to Hunter's Point, L. I.
J. W. Mead	145 Broadway, N. Y., to Madison Sq., N. Y.
Z. C. Nutt	Madison Sq., N. Y., to 145 Broadway, N. Y.
A. Y. Reid	145 Broadway, N. Y., to Appleton's, N. Y.
Mrs. L. Stevens	Appleton's, N. Y., to Manhattanville, N. Y.
P. L. Watson	Factory, 50th st., to 8th Av. Office, N. Y.
L. F. Weller	Park Place, N.Y., to Westchester House, N.Y.
Miss A. R. Baker	Yarmouth Junc., Me., to Norridgewock, Me.
Miss Jennie Flood	Clinton, Me., to Burnham, Me.
Miss A. Butterfield	Ware, Mass., to Main Office, Boston, Mass.
E. B. Holder	Revere House, Boston, Mass., to 00 Franklin st., Boston, Mass.
H. S. Gordon	Sheffield, Mass., to VanDeusenville, Mass.
Miss L. Fryer	Tarrytown, N.Y., to Poughkeepsie Depot, N.Y.
Miss M. C. Joseph	Garrison's, N. Y., to Tarrytown, N. Y.
Miss E. L. Devine	New Hamburgh, N. Y., to Garrison's, N. Y.
Miss E. Ward	Bloomfield, N. J., to Waterloo, N. J.
C. W. Parent	Camden, N. J., to Philadelphia, Pa.
M. W. Stoll	Waterloo, N. J., to Phillipsburg, N. J.
H. B. Atwater	145 Broadway, N. Y., to Appleton's, Williamsburg.
Chas. E. Gatter	Fulton Market, N. Y., to Corn Exchange, N.Y.
Z. C. Nutt	Madison Square, N. Y., to 145 B'way, N. Y.
C. H. Smith,	Manhattanville, N. Y., to Spuyten Duyvil, N. Y.
Herbert Smith	42d st., N. Y., to Park Place, N. Y.
Z. Gibbs	Taunton, Mass., to South Windham, Conn.

RESIGNATIONS.

C. P. Baldwin	operator	145 Broadway, N. Y.
W. W. Griffin	operator	Mineola, L. I.
Miss Mary S. Joslin	operator	Hunter's Point, L. I.
W. S. Langdon	operator	Manhattanville, N. Y.
Thos. Phillips	operator	Canal st., N. Y.
Chas. Willis	operator	Board Brokers, N. Y.
James Rannie	operator	Plaster Cove, C. B.
Mrs. Sarah Milliken	operator	Burnham.
J. A. Spafford	manager	Eagle Bridge, N. Y.
E. G. Mason	operator	Rutland, Vt.
G. W. Finch	operator	Valley Falls, N. Y.
Drury & Rice	operator	Milford, Mass.
Z. Gibbs	operator	So. Windham, Conn.
F. A. Hardy	operator	Boston, Mass.
E. J. Davis	operator	Boston, Mass.
Miss O. L. Wood	operator	Boston, Mass.
Wm. K. Adams	operator	VanDeusenville, Mass.
Miss L. E. Atwater	operator	Poughkeepsie Depot, N. Y.
Samuel Connor	operator	Baltimore, Md.
E. T. Galloway	operator	Dover, N. J.
Samuel H. Bates	operator	Newark, N. J.
E. C. Stewart	operator	Washington, D. C.
A. C. Hoffman	operator	Phillipsburg, N. J.
Harry L. Weikel	operator	Port Clinton, Pa.
S. B. Roberts	operator	Washington, D. C.
Charles Gosden	operator	Parkersburg, W. Va.
Miss S. E. Cornwall	operator	145 Broadway, N. Y.
T. C. Douglass	operator	Hunter's Point, N. Y.
A. Flowers	operator	145 Broadway, N. Y.
Jas. McDonald	operator	8th Avenue, N. Y.
J. W. Copeland	manager	Brandon, Vt.
F. H. Allen	manager	West Boylston, Mass.
O. Benedict	operator	South Norwalk, Conn.
D. Harmon, Jr.	operator	Boston, Mass.
C. A. Mott	operator	Milford, Mass.
Miss E. J. Spencer	operator	Westbrook, Conn.
Miss B. A. Thompson	operator	Holliston, Mass.
J. E. Wright	operator	Boston, Mass.
P. N. McCauley	operator	Ft. Washington, N. Y.
R. B. Hill	operator	Farmer Village, N. Y.
E. R. Rindge	operator	Chenango Forks, N. Y.
R. B. Sweat	operator	Clyde, N. Y.
Miss Julia H. Tyler	operator	Skaneateles, N. Y.
John McCarty	operator	Scranton, Pa.
James F. Morrison	operator	Washington, D. C.
U. J. Ramsey	operator	Manchester, N. J.
J. H. Reeves	operator	Pemberton, N. J.
W. A. Schenck	operator	Hackettstown, N. J.

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THE MORSE CODE THE LANGUAGE OF THE WORLD.

Prior to the transfer two codes for signalling were in use in the United Kingdom. One code was that which had been specially arranged for the Bright's bell telegraph by the Magnetic Telegraph Company, and was in use at all the stations of that company; the other was the code known as the Morse alphabet, and was in use at the stations of the Electric and United Kingdom Companies. As it was absolutely necessary that the code should, as quickly as possible, be made uniform, and as the Morse code was in use by the greatest number of clerks, and was, moreover, *the general telegraphic language of the world*, it was chosen in preference to the Magnetic code. Early in the year 1869 the Magnetic Company's clerks were requested, through their employers, to make themselves acquainted with the Morse code, and we were more than once led to believe that they would have mastered it prior to the transfer.

All, however, had not mastered it at that date, and for many months we were compelled, in a great number of cases, to arrange the staff in such a manner that Magnetic clerks at one end of a circuit should have Magnetic clerks to work with at the other end. This difficulty has now almost entirely disappeared. For the use of the Magnetic clerks who had to learn the Morse code, and more especially for the guidance of the numerous fresh learners whom the department had to train, a paper of "Instructions to persons engaged in learning the Morse alphabet" was prepared. As it may be necessary for me hereafter to refer to the Morse code, it will, perhaps, be convenient to have it described here, and I therefore give a few extracts from the paper in question:

Extracts.

"In sending messages by the single needle instrument the signals are formed by turning the top of the needle to the left or the right.

"In sending messages by the bell instrument the signals are formed by strokes on the left bell, or strokes on the right bell, of two bells placed opposite to each other.

"In sending a message by the Morse printing instrument the signals are formed of dots (- - - -) and dashes (— — — —). A dot is produced by tapping the key or hammer of the sending instrument sharply. A dash is produced by holding down the same key or hammer while you can count three.

"In signalling on these instruments, a turn of the top point of the needle to the left (on the single needle instrument), a stroke on the left bell (of the bell instrument), and a dot (on the printing instrument), have one and the same meaning. A turn of the top point of the needle to the right, a stroke on the right bell, a dash on the printing instrument, have one and the same meaning. Turns and strokes to the left are the same signals as dots; turns and strokes to the right are the same signals as dashes. Thus if you know how to read a message on one of the three instruments, and keep this rule in mind, you may readily read the same message on either of the other two instruments.

"If you want to send the letter E on the single needle instrument you must cause the top point of the needle to turn once to the left; if you want to send the letter E on the bell instrument you must cause a stroke to fall on the left bell; if you want to send the letter E on the printing instrument you must produce a dot (-). If you want to send the letter T on the single needle instrument you must cause the top point of the needle to turn once to the right; if you want to send it on the bell instrument you must cause a stroke to fall on the right bell; if you want to send it on the printing instrument you must produce a dash (—). If, when signals are sent to you, you see the needle (of the single needle instrument) turn once to the left, or if you hear a stroke fall once on the left bell (of the bell instrument), or if you see a single dot (-) printed by the printing instrument, you will know that the letter E is sent to you. On the other hand, if you see the top of the needle turn once to the right, or hear one stroke on the right bell, or see a dash (—) printed before you, you will know that the letter T is sent to you."—*Scudamore's Report.*

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To the Editor of the Journal of the Telegraph:

In your issue of April 15, I notice this item:

"W. H. Harrington, for several years past division operator, in charge of the Iowa division of the telegraph of North Western Railroad, &c., &c."

This is an error. Mr. Harrington's division extended only from Clinton to Boone, Iowa; from whence to Council Bluffs, it is, and has been for the past five years, under the able management of the courteous and ever-obliging M. M. Towne.

By making this correction, you will oblige

One that Knows

TELEGRAPH CIRCUITS.

The invention of the electric telegraph is comparatively of recent date. Scarce thirty years have elapsed since the first practical lines were carried out, and yet in this short period vast sums of money have been expended on its construction. Metallic nerves of thought and speech traverse the globe in its length and breadth. Continents and nations are united together with a link that almost bids defiance to time and space. The ramifications of this system of correspondence are now so extensive and complicated, and the utility to commerce and civilization of the means of communication thus opened up, are so thoroughly appreciated and understood, that a clear conception of the extent and geographical distribution of the principal telegraph circuits of the world is necessary before any of the detail of manipulation, construction and organization of the lines is entered into.

London, as the chief commercial centre of the globe, the vast hive of industry and capital into which the commerce of the world flows, is necessarily the focus of all these main arteries of electrical speech. Turning to the East, in the first instance, numerous lines diverge towards the continent of Europe, many of which, for the purposes of this description may be classed as local lines, serving simply as a connection between England and the internal telegraphic network of central Europe and France. The lines belonging to the Submarine Telegraph Company connect the French telegraph system with that of England, and those which are the property of the Postmaster General connect England with Belgium and Holland and the telegraphic system of the Germanic States. These lines assume the position of local circuits, as compared with the great systems which isolate themselves from the mass, and form distinctive circuits with a special traffic and organization. Commencing with Northern Europe and the higher latitudes, the first in extent and importance are the lines of the Great Northern Telegraph Company, working in connection with the circuits of the Great Northern Telegraph China and Japan Extension Company, and together forming a through system of more than 12,000 geographical miles. A special wire service from London, at present under the control of the Postmaster General as far as the inland traffic is concerned, extends to a submarine cable of 390 nautical miles, which, leaving the Northumberland coast at Newbiggin (a small fishing village some 17 miles north of Newcastle) crosses the North Sea at an average depth of 35 fathoms and reaches the coast of Jutland, Denmark, at Ringkjöbing. Thence 60 miles of land line carry the circuit to Fredericia, the telegraphic centre of the Danish Government system. At this point the Great Northern Company's circuit divides into three branches. One extends eastwards direct to Copenhagen, crossing the Great and Little Belts, a distance of 120 miles. A second passes due north to Hirtshals, and by submarine cable across the Skagerrak reaches Arendal, in Norway, a distance of 200 miles, from whence the circuit is extended to Christiania by land wire, a further distance of 120 miles. A third branch leaves Fredericia for the Island of Moen, a distance of 120 miles, and by a submarine cable of 320 nautical miles via Bornholm traverses the Baltic at an average depth of 50 fathoms direct to Libau, in Russia. Special land wires continue the circuit into St. Petersburg. Further north from London, and also reached by a special inland service, likewise under the control of the Postmaster General, a duplicate system of communication belonging to the Great Northern Telegraph Company is *en rapport* with St. Petersburg, via Norway and Sweden.

From Peterhead, a submarine cable of 250 nautical miles crosses the North Sea at an average depth of 60 fathoms to Egersund, in Norway, and from thence by land wire to Christiania, 200 miles. From Christiania the circuit reaches Stockholm, a further distance of 200 miles, and by a submarine cable from Grisselhamn, laid north of the Aland Islands, across the Gulf of Bothnia to Nystad, 90 nautical miles. A land line of 360 miles completes this duplicate circuit into St. Petersburg. The Great Northern Telegraph Company's circuits therefore command a direct service between London and Copenhagen, Christiania, Stockholm and St. Petersburg, and, under the concessions granted to the company by the Governments of Denmark, Norway, Sweden and Russia, the exclusive telegraphic traffic of those kingdoms to and from Great Britain.

At St. Petersburg the circuits of the Great Northern Telegraph Company merge into those of the Great Northern Telegraph China and Japan Extension Company, working in direct correspondence with the service from St. Petersburg into Great Britain. The circuits of this company are remarkable for the great extent of land line traversing high latitudes across the vast plains and steppes of Siberia. Leaving St. Petersburg the line passes through Moscow and the Russian towns of Vladimer, Kazan and Perm, crosses the Ural Mountains into Asiatic Russia, with stations at Omsk, Tomsk, Irkutsk, Kiachta and Kabarowka, and on to the Gulf of Posiette, the terminal boundary of the Russian Chinese frontier, a distance from Libau in the Baltic, of 7,600 geographical miles. From Poisette a direct submarine cable, now in course of submergence, will reach Shanghai, a distance of 1,000 nautical miles, which port will be the first telegraph station in Northern China placed in direct communication with Great Britain by special circuit. From Shanghai the circuit is extended southwards to Hong Kong by a submarine cable of 880 nautical miles in length. The telegraphic distance between London and Hong Kong by the Great Northern routes via St. Petersburg may therefore be estimated at 10,600 geographical miles, of which 8,100 miles are formed of land wire and 2,500 of submarine cable circuit. At Hong Kong this system will join those of the Indian Equatorial Telegraph circuits, reaching Great Britain via Singapore. Not only will the Great Northern Telegraph Companies maintain direct and exclusive communication with Northern China, but its circuits are so constituted with regard to the Russian lines, that they afford an alternative route to India via Tiflis and the Persian Gulf. From St. Petersburg a circuit is open via Moscow, Tiflis, Teheran and Ispahan on to Bushire, joining the Indian Government lines via the Persian Gulf to Kurrachee. Thus the Indian possessions of our empire may be reached by the Great Northern circuits via Russia in competition with the more southern lines of the Indian Government and those of private enterprise.—*Mechanics' Magazine, London.*

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To the Editor of the Journal of the Telegraph:

What is the best mode of learning the measurement of electricity so as to locate a cross or break? How are ohms determined?

Hoping to see these questions asked and answered in the columns of your next,

I remain, very truly yours,

Young, Operator.

Although there are many elaborate works on this subject, we think "Pope's Modern Practice," New York, D. Van Nostrand, the only one fit for ordinary use by the average operator. It has all the information needed, and may be studied by telegraph students with signal pleasure and profit.

MANUFACTURE OF WIRE.

An English inventor has patented a method, by which the heat is retained in the metal during the process of treating wire. This, it is claimed, produces much better and stronger wire than the old process. His specification states that he secures the end of the wire, as it leaves the first pair of rolls, upon a revolving drum, which takes up the wire in a hot state, so that it coils itself in layers thereon, whereby the heat which it contains is kept in it. The drum may be enclosed in a suitable casing or jacket, to which, if desired, the heat from a fire or other source may be applied, or the drum may be employed without a casing or jacket. When the full length of wire has passed through the first pair of rolls and on to the drum, the action is reversed, and the wire passed through fresh rolls, when it is taken up by another drum, and so on until the wire is sufficiently reduced. By this means it is said that the inventor is enabled to produce longer lengths of wire and of a better finish than heretofore.

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THE MAGNETIC INFLUENCE OF THE FEMALE SEX.

A commander in the royal mail service found his steamer some thirty miles out of her course. He was sorely troubled, and could not account for the local attraction that had sent him so far out of the way. Instruments and calculations appeared equally faultless. Sorely troubled, from having passed a sleepless, watchful night, the captain went on deck after breakfast. Seeing a lady sitting (as was her custom) and working near the binnacle, it occurred to him that probably the scissors were resting on the ledge of it. Detecting nothing of the sort, and bent on closer investigation, he discovered that her chair had an iron frame. It also, quite reasonably, flashed across him that the lady's ample crinoline was extended by steel hoops. So, mustering all his faculties, he exclaimed, with as much forgiveness and as little reproach in his tones as possible, "Madam, you have, by your local attraction, drawn my ship some forty miles from her course!"

◆

Make a Note of It.—The Chinese have some notions that might be advantageously adopted by Christians. The way they celebrate their holidays is one of them. The first thing they do is to pay off old debts and square accounts to a fraction. Money matters having been thus adjusted, they next make up old quarrels, and shake hands all round. Having thus got square pecuniarily and socially, they eat, drink, are merry, finally winding up with a sparkling discharge of Chinese fire-crackers. This paying of debts and the making up of quarrels is certainly a good way to begin a celebration of holidays.

◆

THE HUMAN FEET, their Dress and Care, showing their natural, perfect shape and construction; their present deformed condition; and how flat feet, distorted toes, and other defects are to be prevented or corrected, with directions for dressing them elegantly, yet comfortably, and hints upon various matters relating to the whole subject, with Illustrations. 12mo. 202 pp. Price, $1,25. New York: S. R. Wells, 389 Broadway.

Who has not suffered torture from tight or ill-fitting shoes or boots? What man or woman, brought up in civilized society, can say with truth, that his or her feet are sound, and free from blemish? The object of this book is to teach the reader how to treat and dress the feet, that there may be no more corns, bunions, aches or pains. It is possible to have sound feet on sound bodies, and this work shows how. Written in a plain, practical manner, with physiological and mechanical illustrations, it is at once scientific, philosophical and instructive.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—
JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, MAY 15, 1871.

REASONS FOR THE CHANGE.

It is impossible to read over the evidence of the report of Mr. Scudamore, recently presented to the British Parliament, without finding evidence that the management of the private companies was somewhat provocative of the change of the telegraphic administration in Great Britain. We are very unwilling to acknowledge it, but we must.

One of the most glaring defects of the old administration was the fact that so large a number of quite important towns were left dependant for their telegraphic facilities upon railroad stations far from the centre of population. It thus happened that a double evil was experienced. When a message came to a station, the station master had to employ any chance idler whom he could employ to deliver it, or failing to find such a one when the message was received, wait until some school boy or village loafer made his appearance. Added to this, was the unpleasant fact that a porterage, or charge for legs, had to be added, which often doubled the cost of transmission. In a country like Great Britain, where every penny is carefully watched, this porterage was a serious evil, and had much to do with the popular desire for a change. The offices are now being planted, as in America, as nearly as possible in commercial centres.

In the provision of Press news, also, there appears to have been a needless combination of the leading Presses and the Telegraph Company, which gave an offensive monopoly of public news. The terms were high, and the service exclusive.

There seems also to have been an undue attention to several special classes of speculative or other business. These appear to have been conducted to the injury of ordinary mercantile correspondence. The new regime seems to have adopted the other extreme, and to have largely cut off the means of rapid transmission for stock brokers' messages, which, in New York, is given without at all disturbing the equally prompt despatch of strictly commercial business. It is very curious to observe the large amounts which were formerly derivable from the great horse races at Epsom and elsewhere, from which there is no considerable revenue derivable in this, or, indeed, any other country in the world. Provision for these races is not withheld, but modified not unfairly.

A general review of the report makes it apparent, we think, that the private management was defective and provocative of a change. We do not believe that any such charge can be laid to the administration of telegraph lines in America as the excuse for its passage into any other hands, nor is it at all likely to do so, at least for many more years to come.

◆

GOOD SIGNS.

We notice among the favorable signs of improvement in the morale of the craft, that fewer persons are reported monthly as dismissed from the service. Still fewer are reported as dismissed for drunkenness. Not a single person was dismissed for misconduct in the entire Eastern Division during February and March.

We have before us a letter written some time ago, desiring that THE JOURNAL could be used for the inculcation of a higher moral sentiment in the ranks of telegraph men. The direction hinted at as the one most needed was in regard to this very matter of intemperance. We know how prevalent a curse this has been—how much there is of it now. We wish we could, by some skillful use of language, induce every man to let the cursed thing alone. It means waste of body, of mind, of heart, of happiness, of means. It irritates and is irritable, destroys self-respect, and leads to mischief, error, irregularity and disgrace. We all know that. We might say so ten thousand times and do no good by saying it. So we have taken another way. We have tried to infuse purity of thought into whatever we wrote, no matter what the subject; to interest in works of genuine charity and mutual care of each other; to attract attention to objects which infuse feelings of brotherhood and enterprise, and in which the heart might have its say. It may not have been by anything we have done or said that the telegraphic staff is higher and nobler and purer to-day; yet we have desired it so, and striven for it with all our heart. Not by scolding, not by exhortation, not by sermons on moral actions which nobody would have read, but by simply desiring that every word should breathe a spirit of the highest honor and the most genuine kindness, have we sought to infuse the seed of nobler living. It was cast on the waters in hope. Some of it may grow. When a man is lifted to a generous connection with healthy enterprise, self-respect grows strong, and the degrading, cursing thing is more likely to stand untouched.

We believe it would be a grand thing for all if total abstinence was made a condition of employment on all telegraph lines. Rum has ruined our best men. We can count by the dozen bright men who have gone down to the grave blighted and broken by it. The business needs a steady hand and a quiet body. Rum makes a man restless, blind, impatient. No message is safe in his hands. When an organization is proposed to drive rum from the ranks, we desire to have an early membership.

THE SAVAGES AND THE TELEGRAPH—*A Trick on the Auracanian Indians.*—It is not a little curious, says the *Independente*, of Chile, to know how the telegraph wires and posts have been preserved from injury by the Indians, otherwise the communication of the frontier forts with one another could not have been kept up. The following stratagem was hit upon and related by a traveller recently from the frontier, who was asked how this was. He said when the posts were erected there were some forty or fifty Indian prisoners in the camp of the army. General Pinto, fearing that they might destroy this important work of civilization, called them together, and brought in an electric battery.

"Do you see this wire which is placed here?"

"Yes, General."

"Well, then, I have caused it to be placed there, so that you should not pass to the other side or touch it, because if you do, your hands will adhere to the wire."

The Indians smiled with an incredulous look. The general called them one by one, and made them lay hold of the wires of a battery, and then set it going.

"Let go the wires, I tell you."

"I cannot, sir, my hands are benumbed."

On cutting off the current, of course they dropped the wires. Each Indian was made to experiment for himself. Before letting them go, the General recommended them to keep the secret, and not to tell it to their countrymen.

Of course they did quite the contrary, and told every Indian what they had seen, and what had happened to them. Since then, not a wire has been damaged, because they now all believe that if they touched the wires they would be caught and held prisoners until troops came up.

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UNITED STATES AND MEXICO TELEGRAPH CO.

On May 5th this Company was organized as follows:

President—Robert J. Livingston.
Vice-President—W. F. Smith
Engineer—Marshall Lefferts.
Secretary—Alexander Hamilton, Jr

DIRECTORS.

W. F. Smith,
Alex. Hamilton, Jr.,
John Jacob Astor,
H. G. Norton,
Marshall Lefferts,
C. Livingston,
James T. Sanford,
R. J. Livingston,
E. S. Sanford,
William Orton,
M. Delafield,
David H. Haight.
W. B. Dinsmore,

HONORARY DIRECTORS.

Senor Mariscal, Mexican Sec. of State.
Senor Blas Balcarcel, Minister of Fomento.
Sir John C. B. Hay, Rear-Admiral, R. N.
Thomas Hughes, Esq., M. P.
Senor Juan Jose Baz, Mexico.
Senor Juan Manuel de Sevilla, Vera Cruz.

◆

THE messages collected in London form about 20 per cent. of the entire number received in Great Britain. Twenty per cent. of the London collections, averaging 6,000 per week, are for city delivery.

HENRY WEAVER, Esq., the General Manager of the Anglo-American Cable Co., and Gen. Mayne, of the French Cable Co., arrived in the Russia, May 10.

THE present system of private telegraph wires was introduced into England by Sir Charles Wheatstone and Nathaniel J. Holmes in 1860. On July 1st of last year the management of this system was assumed by the General Post Office, and now comprises about 4,400 miles of wire, producing a gross rental of £27,000 per annum.

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ELECTRIC TELEGRAPH SOUNDER, RELAY, ETC.—Hugh S. L. Bryan, Cedar Rapids, Iowa, April 25.—In this invention, the armature of relays or sounders is arranged upon a stem or rod, or other support, having a rectilinear movement between adjustable sounding points, one at each end, the said rod or stem being suspended by vibrating arms, springs, or in any suitable way to have such movement; and the claim also includes a novel arrangement of the magnets, armature and its supports, and the sounding points in an open case.

THE INAUGURATION.

Although anxious to meet the desire to have the Morse Statue inaugurated May 24th, the anniversary of the sending of the first message, yet we feared that it would be found out of the artist's power to have his work complete on that date. And so it has proven.

To prevent any disappointment, and make certain that all will be in complete readiness, and to accommodate as many as possible, the date of the inauguration has been finally fixed for

SATURDAY, JUNE 10th, AT 4 P. M.

The Commissioners of Central Park have, in the kindest manner, approved the date and all prepared arrangements. A full programme will appear in our next. The excursion to the Rivers and Harbor of New York—so generously planned and provided by Mr. Tillotson—will take place at 10 A. M., and the reception of Prof. Morse, in the Academy of Music, will take place in the evening. Arrangements are in progress to make the evening ceremonies full of interest. To Mr. Tillotson's excursion all superintendents, managers, operators, clerks, line and battery men, are invited.

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THE NEWFOUNDLAND SUBSCRIPTION.

We announced receipt, some weeks ago, of a handsome subscription from Newfoundland, through Supt. Mackay, but have only now received the names of the donors, as follows:

A. M. Mackay	$10 00	Reuben Parsons	$2 00
John Waddell	4 00	Gisborne Ward	2 00
J. T. F. Smith	2 00	R. W. Durfee	3 00
A. J. Saunders	2 00	J. A. Roberts	2 00
G. R. Carson	3 00	Nathan Smith	3 00
S. S. Bailey	1 00	M. J. Cavanagh	2 00
H. H. Mackenzie	2 00	E. J. Roche	3 00
E. B. Moore	2 00	T. P. O. Donnell	2 00
A. M. Blackodor	5 00	Thomas Bailey	2 00
J. L. Murphy	2 00	H. S. Stephenson	1 00
John Phippard	2 00	W. P. Hutton	1 00
R. F. Brien	2 00	John LeMoine	2 00
G. K. White	5 00	John Veitch	1 00
G. M. Gaden	2 00		
Edward Murphy	2 00		$71 00

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PRESENTATION.

On May 1, O. H. Dorrance, superintendent of telegraph of the Kansas Pacific R. R., was presented by his friends and subordinates with a nickel silver tea service of great value and beauty. The set consisted of twenty-four pieces. The tray bore the following inscription: "Presented to O. H. Dorrance, by the operators of the Kansas Pacific Railway." The set cost upwards of $400. The magnificent present was presented by W. H. Fanning, as follows:

> Your friends and subordinates, operators of the Kansas Pacific Railway, a number of whom you see present this evening, have assembled to express to you, through me, their profound respect and appreciation of you as their superintendent, by presenting you with this token, a silver set consisting of twenty-four pieces. During your connection with this company, none have formed truer or warmer friends than yourself. As a general telegraph manager, you have so systematized this important branch, that to-day we can claim a system of railway telegraphing second to none. With your co-operatives, all will bear evidence to the kind, considerate and impartial manner in which you have performed your duties. We hope you will accept this memento not for its intrinsic value, but as a sincere expression of our heartfelt esteem; and may health and prosperity ever bless you and yours.

Mr. Dorrance returned his thanks for the valuable present. He had been taken entirely by surprise, and was totally unprepared to respond. Still in a most graceful manner he conveyed to his friends a sense of the feelings he experienced in receiving their handsome gift.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
May 15, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since May 1, the date of the last tariff order.

Managers are hereby required to enter these changes into their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

110 Adam's Basin, N. Y., re-op'd.
408 Allerton, Iowa.
37 Beacon Falls, Conn.
312 Cherokee, Ala., re-opened.
456 Effingham, Ks.
222 Egypt, Miss.
448 Grand River, Ind. Terr.
47 Hornerstown, N. J. Check Bordentown, N. J.
69 Holmesburg Junc., Pa.
361 Hopefield, Ark.
Mahone Bay, N. S., 100 currency, 70 gold, more than Calais, Me.
McAdam, N. B., 30 currency, 20 gold, more than Calais, Me.
257 Newnan, Ga., re-opened.
Ogallala, Neb. Heretofore an other line office. Tariff 160 more than Omaha, Neb.
394 Ocean Springs, Miss.
394 Pascagoula, Miss.
Pine Bluffs, Wy. Heretofore an other line office. Tariff 175 more than Omaha, Neb.
64 Princess Anne, Md., re-op'd
438 Schell City, Mo.
456 Shawnee, Ks.
29 Stoney Creek, Conn.
163 Weaverton, Md.
66 Yatesville, Pa.

OFFICES CLOSED.

Clifton, Iowa, Cumminsville, O.; Kingston, Md.; and Waterloo, N. J.

GENERAL INFORMATION.

On and after June 1, 1871, business for the following offices in Pennsylvania, will be CHECKED DIRECT. The tariff, unless present rates are less, will be the rate by square.

131 Apollo.
131 Allegheny Junc.
131 Brintons.
131 Blairsville.
131 Blairsville Intersection.
102 Bigler.
102 Beech Creek
76 Bainbridge.
59 Bryn Mawr.
112 Cresson.
112 Conemaugh
131 Derry.
94 Duncannon.
59 Downington.
59 Eagle.
76 Elizabethtown.
131 Freeport.
112 Gallitzin.
112 Hollidaysburg.
131 Irwins.
102 Julian.
76 Leaman Place.
76 Landisville.
131 Latrobe.
102 Milesburg.
94 McVeytown.
84 Mifflin.
76 Marysville.
93 Newton Hamilton.
131 New Florence.
131 Natrona.
102 Osceola.
59 Overbrook.
59 Paoli.
59 Parkesburg.
131 Penn.
76 Rockville.
59 Steamboat.
112 Spruce Creek
102 Snow Shoe Int.
102 Sandy Ridge.
131 Saltsburg.
131 Springdale.
151 Sharpsburg.
131 Tarentown.
94 Thompsontown.
112 Wilmore.
76 Wrightsville.
59 Westchester.

Changes in rates to points on N. Y. & O. M. R. R.:

Central Square, N. Y.,	25	2	Oneida, N. Y.
Cleveland, "	25	2	"
Constantia, "	25	2	"
Eaton, "	25	2	"
Junction (D. L. & W. R. R.)	25	2	"
Morrisville,	25	2	"
Munnsville, "	25	2	"
North Bay, "	25	2	"
Oneida Community, N. Y.,	15	2	"
Pennellville, "	25	2	"
Smith's Valley, "	25	2	"
Smyrna, "	25	2	"
De Ruyter, "	25	2	Norwich, N. Y.
Guilford, "	25	2	"
Holmesville, "	25	2	"
Mt. Upton, "	25	2	"
New Berlin, "	25	2	"

No charge is now made for delivery of messages below Fifty-ninth street, New York city.

The tariff between offices of the Eastern, Central and Southern Divisions and Denver, Col., will hereafter be reduced to so as not to exceed five dollars, if present rate is higher than that amount; and between the same offices and Peubla and Trinidad, Col., Cimarron, Fort Union, Los Vegas, and Santa, N. Mexico, not to exceed six dollars.

Business for offices on the Northern Central Railway, in New York, given in the last JOURNAL, with tariff from Elmira, should *be sent and checked* to Canandaigua, N. Y., if rate by the latter is less than via the former office. The notice in the JOURNAL gives a rate which is to be used only *if cheaper and more direct than the present one.*

Half-rate messages may be taken for, and received from Cochran, Eastman, Hawkinsville, and Lumber City, Ga., and Homer, La.

Business for West Lebanon, N. H., may be taken and checked to White River Junc., Vt., from which office it will be delivered. The charges for delivery are 15c.

Assabet, Mass., office, name changed to Maynard, Mass
Groton Junc., " " " Ayer, "
Grinnell, Ks., " " " Buffalo, Ks.

East Side, Oil City, Pa., formerly Venango City, in sq. 140, will hereafter be known as South Side, Oil City, Pa.

Post office address of Franklin, Mo., is Pacific City, Franklin Co., Mo.

For Aberdeen, Miss., in last JOURNAL, read Aberdeen Junc., changed to Muldon, Miss.

For Chef Menteaux, La., in JOURNAL of May 1, read Chef Menteur, La.

OFFICES HAVING "SPECIAL SHEET A."

Tariff to Yatesville, Pa., should be same as Mahanoy City, Pa., and to Myerstown, Pa., same as Lebanon, Pa.

Rate to Chickies, Pa., in last JOURNAL made 10 cents more than Marietta, should be checked at square 76 rate.

ATLANTIC CABLE BUSINESS.

Messages sent hereafter for Alsace and German Lorraine should be charged the rate to North Germany.

The following stations are now open:

Altkirch,
Bitche,
Chateau Saline (Salzburg),
Colmar,
Dannemarie,
Diedenhofen (Thionville),
Gebweiler,
Hagenau (Haguenau),
Metz,
Molsheim,
Mulhausen,
New Breisach,
Pfalzburg.
Rappoldsweiler (Ribeauville,)
Saarburg (Sarrburg),
Saargemund,
St. Amarin,
St. Louis,
St. Marie Aux Mines (Markirch),
Sentheim,
Schlettstadt.
Strasburg,
Thann,
Weissenburg,
Zabern or Saverne,

WILLIAM ORTON, President.

◆

A FEW weeks ago a message was left at an office in Massachusetts for a party in Maine, whose residence was at some distance from a telegraph station. The message was sent, with charges to be collected, which were refused and the message returned. According to rule the sender was requested to settle for the charges, at which proceeding he became highly indignant. In answer to an official note to walk up to the Captain's office and settle, he replied:

"I positively refuse to pay it—at present, any way. I have been sick with consumption, and no prospect of being any better. If you will wait awhile you can take my remains to cancel the bill."

After signing this very gratifying mode of settlement, he adds:

"If ever I get well I will settle, for the sake of hearing no more about it."

We have heard of persons getting well by being thoroughly roused. The idea of the Superintendent of the district taking his remains and selling them to the glue factory to settle his bill, was enough to "wake a soul behind the ribs of death." We think that man will get well, and his transmogrification into a cake of glue be postponed.

◆

THE ship Raleigh, from London, arrived at Key West April 29th, bearing the new cable of the International Ocean Telegraph Co., to be laid between Florida and Cuba. This cable has been very wisely placed under the management of Mr. Heiss, the capable General Superintendent of the Company, who will undoubtedly prove the propriety of the trust by its successful accomplishment.

◆

A COMMUNICATION, signed "A Local," is too long for the subject on which it treats. It claims more consideration for railroad operators, and that they are able, and should get the pay suited to performing the double duties of operator and agent. Some ignorant agent troubles "A Local," and the letter looks like a "dig." The JOURNAL don't dig. It has no funerals.

TELEGRAPHER'S LIFE INSURANCE ASSOCIATION.

A VOTE WANTED.

1. On February 1st, 300 members were notified that they had forfeited membership because of delinquency. One of these was Norman H. Rugg, of Saratoga, N. Y. At that date he owed assessments 17, 18, and 19.

2. On February 9th, an order directing Mr. Horner, Cashier W. Union Co., to pay all assessments due by Mr. Rugg to date, signed by an office assistant at Saratoga, was received, but was not acted upon, because Mr. Horner had no authority to pay on such an order.

3. It was on that day—Feburary 9th—ascertained that Mr. Rugg was at the point of death.

4. On February 10th Mr. Rugg died, and in a few days thereafter a claim was made for his insurance money, which was declined.

It is necessary to state here, so as to understand the position of the Committee in this case, that, at an annual meeting of the Association, by an almost unanimous vote—the only negative vote being that of the Treasurer—it was ordered, that failure to pay an assessment within thirty days of notice should forfeit all claims in case the delinquent died. This was a mere reaffirmation of the original rule, yet rendered more emphatic by this specific vote.

It is necessary, also, to know, that under this order a remittance from a delinquent could not be received unless a certificate of health accompanied the money. This was in the form of an application for restoration, on the acceptance of which the delinquent might be reinstated.

Now the assessments were issued as follows:

Assessment No. 17—November 10, 1870.

Assessment No. 18—December 28, 1870.

Assessment No. 19—January 20, 1871.

Mr. Rugg's account on February 10th stood as follows:

Deficit on Assessment No. 17—91 days.

Deficit on Assessment No. 18—44 days.

Deficit on Assessment No. 19—21 days.

Since then the following evidence has been given by the heirs:

1. It is claimed that Assessment No. 17 was paid by a credit given in his December monthly report of one dollar for that purpose.

On the examination of that report a credit of one dollar was found, without specification of its design, which the Company paid to the Association February 16th, and was passed to the credit of Mr. Rogg's account, the Association waiving any irregularity and the neglect in specifying the design of the credit, by which payment was delayed.

2. It is claimed that, in reference to Assessment No. 18, the notice was found among Mr. Rugg's papers, endorsed—

"Paid by telegraphic order, January 17."

No evidence of any character can be found that this was ever done. No message can be found directing it, and no money was received until Mr. Rugg's decease. Mr. Rugg was well up to Sunday, February 5th, but had at that date not entered any credit in his report, although it was, after his death, entered by his assistant for Assessments 18 and 19. It is upon this failure that forfeiture is claimed. At Mr. Rugg's death Assessment No. 18 had been due 44 days.

In regard to this assessment, the heirs claim, that had Mr. Rugg been in health until February 6th, the entries of credit for 18 and 19 would have been made by him in his report, and that the memorandum found in his papers should be accepted as a payment at the date it bears. The Committee see no reason to change their decision, and decline to take this responsibility, after the action of the annual meeting already noted. They have, therefore, in order to meet the pressure of the claimants and do entire justice to them, ordered the whole case to be presented to the members, and a vote asked on the following question:

Shall Mr. Rugg's membership, at the time of his decease, be acknowledged?

The polls will remain open for answers until July 1st, and be decided by a majority of the replies received. The answers will be simply:

In the Norman H. Rugg case I vote "yes" or "no," as the respondents decide.

No reference has been made to assessment No. 19, because the thirty days on it had not expired when Mr. Rugg died.

The members are also notified that the following resolution is in force:

"*Resolved*, That in the settlement of claims of heirs every assessment shall be definitely closed at the expiration of sixty days from the date of its being called, and the amount of said assessment, then in the hands of the Treasurer, be the full sum payable to the heirs of the party to whom it may be due. All receipts upon any assessment received after the expiration of sixty days, shall be credited to the expense account of the association."

Members of the Association will bear in mind that with so large and scattered a membership it is necessary for them to be exceedingly careful in carrying out rules, even where their personal inclinations and sympathies might incline to waive their strict construction.

◆

To help the subscription for the reception at the Academy of Music, all orders for the Morse engraving, which is accompanied with the autograph of the venerable subject, will be applied to the fund until complete. All who send their dollar, therefore, for the picture, will have the pleasure of knowing that it is used for the expenses of what must prove a very gratifying occasion.

We have to request all who design coming to the Inauguration to notify the Committee, who are quite anxious to be of service to them, and to arrange, as far as they can, for their comfort and reduced charges at the hotels. Mr. Tillotson would also be glad to know how large a steamer to charter for the Harbor excursion. Notices may be addressed to any of the Committee or to the Editor of the Journal.

MORSE TESTIMONIAL FUND.

The following were received after our announcement of the closing of the Fund. We think we erred in making it, as it is already evident that the sums sent will all be needed:

Oscar G. Sawyer, Salt Lake Tribune	$1 00
C. Keyson King, Bloomfield, N. J.	1 00
Philip F. Harris, Anglo Amer. Tel Co N. Y.	1 00
L. T. Mason, operator, Dunkirk, N. Y.	1 00
Charles P. McAllister, operator, Catasaqua, Pa	$1 00
A. L. Page, operator, New Rochelle, N. Y.	1 25

FROM THE "BLUE JUNIATA."

Miss Jennie V. Crane, manager, Thompsontown, Pa	1 00
Austin E. Woods, night operator, " "	1 00

INTERNATIONAL OCEAN TELEGRAPH CO.

We are glad to receive the following testimony from the staff of the Telegraph line to Cuba, proving that every Company is in sympathy with the movement to do honor to one who has so honored his age.

Contributions of the operators of the International Ocean Telegraph Co.'s line to the

MORSE TESTIMONIAL FUND.

W. Heiss, Gen. Supt.			$5 00
W. Ledwitch, supt.,		Punta Rassa, Fla.	3 00
Jno. E. Crowley,	manager,	Lake City, Fla.	2 00
W. H. Ball,	"	Key West, Fla.	3 00
Thomas S. Clarke,	"	Punta Passa, Fla.	2 00
A. L. Canova,	"	Jacksonville, Fla.	2 00
G. R. Schultz,	"	Punta Rassa, Fla.	2 00
Daniel J. Crowley,	"	Lake City, Fla.	2 00
Daniel B. Hamlin,	"	"	2 00
C. S. Maloney,	"	Key West, Fla.	2 00
C. W. Thompson,	"	Caloosahatchie, Fla.	2 00
W. A. Johnson,	"	Pine Island, Fla.	2 00
W. H. Pearce,	"	Bartow, Fla.	2 00
W. T. Branch,	"	Branch River, Fla.	1 00
B. C. Edwards,	"	St. Augustine, Fla.	2 00
Thomas E. Gough,	"	Sumterville, Fla.	3 00
J. D. Redding,	"	Tuckertown, Fla.	5 00
Oscar D. Morris,	"	Ocala, Fla.	2 00
J. W. Francis,	"	Gainesville, Fla.	2 00
C. V. Heiss, relief operator, Fla.			2 00
Total			$48 00

Yours truly, W. H. Hams.

◆

THE COMMITTEE OF RECEPTION.

In nominating the Committee of Reception, we did so somewhat hastily. Since then the matter has been given up to the selection of operators, who have agreed upon the following:

W. H. Applebaugh,
Gerritt Smith,
Fred. T. Bickford,
C. E. Higdon,
R. B. Lown,
F. H. Seibert,
T. Carter,
P. T. Hauff,
C. J. Ryan.

We have been requested to act on this Committee, and will do so, as far as possible. Mr. Horn, Jr., is required on other duties, and is engaged providing funds for the evening reception.

◆

BORN.

To Mr. O. F. Cantwell, Manager W. U. Tel., Hartford City, Ind., May 6th, a fine girl; "nine pounder;" first child.

MARRIED.

CHAMBERLIN—PACKARD.—On Wednesday, May 10, at Rome, N. Y., Humphrey B. Chamberlin, Manager W. U. office, Fulton, N. Y., to Miss Alice Packard, of Rome.—Humphrey, we wish you joy. May the *circuit* of life of you and yours be long, the *lines* always *clear*, with the *current* of love so intense that *crosses* cannot interfere, nor family *jars* annoy.
W. M.

BARKS—WHITMER—At 7½ A. M., May 4, 1871, by Rev. T. R. Taylor, Mr. A. Y. Barks, Manager W. U. Office, Lancaster, Ohio, to Miss Carolina Whitmer, of that place. Ab. has been quietly "sticking" to "B. H." for some time, and we had begun to think he was a confirmed bachelor; but the "key" of his affections has been held for some time by one of the fair sex. And now, since the "splice" has been made, we sincerely hope he will, in due time, be made familiar with the new call of "PA" from a reasonable number of "local sounders" and that his happiness may be always without a "break" or a "fault," is the heartfelt wish of
THE LANCASTER FRATERNITY.

SABINE—BUCHANAN.—In Utica, at the residence of the bride's father, by Rev. A. B. Goodrich, Rector Calvary Church, John B. Sabine assistant cashier People's Savings Bank, Syracuse, to C. Olivia Buchanan, daughter of Thomas Buchanan, Jr., Esq., of Utica, N. Y.

THE grandest underground work in the world is, perhaps, the Ernst Augusta Gallery—one of the five belonging to a metal mine in the Hartz. The gallery is six miles and three-fourths in direct length; but, if its lateral branches were taken into account, and a subterranean gallery, navigable for boats, which opens into it, the Ernst Augusta Gallery is not less than fifteen miles long. The survey was so skillfully made, and the plans so accurately drawn, that all the junctions of the different sections fitted exactly into each other, the admirable precision of the results having been partly insured by the aid of a magnet, weighing two hundred pounds, which influenced the compass through the solid rock sixty-five feet deep, and which was kept in one of the working places, while the compass was held in the other.

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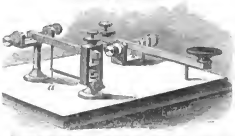

For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

This instrument is an outgrowth of this pressing demand. The inventor is himself a practical operator, now in active service. Operators and others wishing to teach or learn the Art, will be delighted with this instrument.

It can be placed anywhere, as it does not occupy a space more than six inches square. A card with the Telegraph Alphabet, Numerals, &c., attached to each instrument.

Its cost is but $7, and there is no expense whatever to keep it constantly in working order.

We will send a copy of SMITH'S MANUAL, free of charge, with each instrument, to individuals or clubs.

Any person selling ten or more of the instruments, will be allowed ten per cent. commission, sent C. O. D., or on receipt of price.

Special and liberal terms to manufacturers.

To save expense of returning funds by express, remittances can be made by draft on Cleveland or Pittsburgh, or by Post Office Order, in which case no charge will be made for box. Price $7. Silver-plated, extra finish, $10.

Parties ordering instruments, except from well-known cities, will please give name of county and State.

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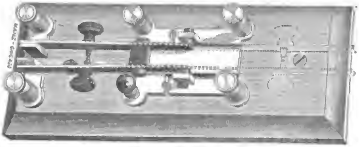

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Having completed our arrangements to manufacture, by putting in new machinery, and with a full force of workmen, we are now ready to supply the GREAT DEMAND for these Badge Pins. They are made of 18k gold, and are perfect fac-simile of the present MORSE, or curved lever keys, and the new style WESTERN UNION straight lever and FANCY BASE KEYS. We are now making two different sizes, one to be three-quarters of an inch long, and the other one inch long. Also, a very small, neat, BADGE KEY PIN for LADY OPERATORS. These are the only badge pins ever got up exclusively for Operators.

We are, also, manufacturing a complete set of RAILROAD BADGE PINS, for CONDUCTORS, BAGGAGE-MASTERS, BRAKEMEN, STATION AGENTS, and others, consisting of Punches, Passenger Cars (Pullman's Palace Pattern), Switch Targets, Coupon Tickets, &c. These Badges are all made of the most approved patterns.

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Key Pin, oval base, one inch long	$6 00
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Telegraphers'

Mutual Life Insurance Association.

INCORPORATED UNDER THE LAWS OF THE STATE OF NEW YORK.

I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and th payment of dues

XI. A meeting for the election of officers shall be held annually during th first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written reques of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer.

GERRITT SMITH, Secretary.
A. S. BROWN,
W. H. HILL,
D. R. DOWNER,
Executive Committee.

DIRECTIONS TO APPLICANTS.

1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to Gerritt Smith, Secretary Telegraphers' Mutual Life Insurance Association, 145 Broadway, New York, and a certificate of membership will be sent by return mail.

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

5. No letters can be answered unless a stamp is enclosed for postage; and as the officers labor without compensation, correspondence requiring answers should be as limited as possible.

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Gutta Percha Covered Telegraph Office Wires, in great variety of and style.

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for out-door use and office connections.

INSULATED WIRES,

with two Conductors, both plain and with braid outside, and great variety of other kinds made to order.

Cotton and Silk-Covered Wires, both twist and braided.

This arrangement with Mr. BISHOP, together with our own extensive Manufactory in New York, and our great variety of Telegraph Material in stock, fully establish our claim that our stores are the depots of telegraph supplies in this country.

THE SELF-CLOSING TELEGRAPH KEY.

PATENTED SEPT. 21, 1869.

PRICE $5.

A perfect, simple, homogeneous Self-Closing Key.—JOURNAL OF THE TELEGRAPH.

For full description and testimonial see JOURNAL, Dec. 15, 1870. Liberal terms and arrangements will be made with the trade, telegraph companies and contractors. Sample keys now ready.

JOS. J. B. FREY,
Inventor and Patentee.

A. ILLING,
218 Church Street,
New York City.

CHARLES WILLIAMS, Jr.,

(ESTABLISHED 1856,)

109 Court Street, Boston,

Manufactures and has for sale the various kinds of

OFFICE AND MAGNET WIRES,

Including Cotton Covered, Silk, Gutta Percha, Painted, Fancy, and

DAY'S KERITE COVERED WIRE.

Also, a full assortment of

BATTERIES,

For Telegraphing, Plating, Electrotyping and Experimenting.

SCREW GLASS INSULATORS AND BRACKETS,

Of the size and thread used by the Western Union Telegraph Company.

Having secured an Exclusive Agency for these Insulators, (manufactured under the Cauvet patent,) we are filling orders promptly for large or small quantities, at prices as low as any Insulator can be sold for in the market.

GRAY & BARTON,

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GALVANOMETER,

AND RESISTANCE COILS,

On the principle of the

WHEATSTONE BALANCE.

We have supplied a large number of these

INDISPENSABLE HELPS

Towards securing a good working telegraph line to various Superintendents and operators, and can supply orders on short notice, as we keep the instruments in stock already finished.

Our Galvanometer is designed expressly for Telegraph Service—is light, portable, and easily handled.

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Manufacturers and Dealers in all kinds of

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Now offer for sale, or will manufacture to order,

REGISTERS,
RELAYS,
KEYS,
LIGHTNING ARRESTERS,
SOUNDERS,
SWITCHES,

And every variety of Instruments now in use. Among the supplies constantly kept on hand, are the following;

Battery Materials of all kinds, Line Wire, all sizes, Brackets, Insulators, Medical Batteries (induced or direct current), Fire and Burglar Alarms for Banking Houses and Private Residences, as well as for Cities and Towns; also Contractors for the Construction, Reconstruction and Repair of Telegraph Lines throughout the United States.

All the Standard Works on Telegraphy furnished at the lowest prices, among which is the latest work of

MODERN PRACTICE OF THE ELECTRIC TELEGRAPH.

By Frank L. Pope.

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AND

POLICE TELEGRAPH.

GAMEWELL & CO., PROPRIETORS,

NO. 104 CENTRE STREET, NEW YORK.

This system of Fire Alarm Telegraph, with a central office, or upon the

AUTOMATIC PLAN,

is now in operation in the following cities, to which reference is made for evidence of its great SUPERIORITY AND VALUE, and UNIFORM reliability:

BOSTON,
CHICAGO,
PHILADELPHIA,
CINCINNATI,
ST. LOUIS,
BUFFALO,
BALTIMORE,
MOBILE,
NEW ORLEANS,
PITTSBURG,
LOUISVILLE,
ALLEGHANY,
MONTREAL,
QUEBEC,

PORTLAND,
ST. JOHN, N. B.,
HARTFORD,
TROY,
NEW HAVEN,
ROCHESTER,
SPRINGFIELD,
TOLEDO,
ALBANY,
COLUMBUS,
LAWRENCE,
MILWAUKEE,
SAN FRANCISCO,
CAMBRIDGE,

WASHINGTON, D. C.

The distinctive features of

THE AMERICAN FIRE ALARM TELEGRAPH

are a Combination of Circuits, the Automatic Signal Boxes, Electro-Mechanical Bell and Gong Strikers.

THE AMERICAN FIRE ALARM AND POLICE TELEGRAPH is covered by some twenty patents. Very early after its introduction into Boston, GAMEWELL & Co. purchased the original patents of FARMER & CHANNING, and during the past fifteen years have spared no expense or pains to improve and perfect this system.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

L. G. TILLOTSON & CO.

8 DEY STREET, NEW YORK,

MANUFACTURERS OF

TELEGRAPH INSTRUMENTS

AND

MATERIALS OF EVERY DESCRIPTION.

General Agents for the

AMERICAN COMPOUND TELEGRAPH WIRE COMPANY.

The Compound Wire has now stood every test to which it can be subjected. Over twelve hundred miles of it are now in operation with the most satisfactory results.

General Agents for S. C. Bishop's

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GUTTA PERCHA AND OTHER INSULATED WIRES.

General Agents for

PURE NITRIC AND SULPHURIC ACIDS

Manufactured by the Lodi Chemical Works.

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CARBON
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And every description of

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Zincs, Porous Cups, Platinum, Acids, Quicksilver, Tumblers Coppers, &c. All of the most approved Pattern and Best Quality.

REGISTER PAPER, MANIFOLD PAPER, MESSAGE PAPER (IN STRIPS).

Printed Message Heads and Envelopes

On hand and furnished to order.

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AT THE

LOWEST MANUFACTURERS' PRICES,

COPPER AND BRASS WIRE

Of any number required.

OFFICE WIRE,

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AND

MAGNET WIRE.

*REGISTERS,
RELAY MAGNETS,
SOUNDERS,
KEYS,
CIRCUIT-CLOSERS,
CUT-OUTS,
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Kerosene Head Lamps,
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For Strength, Beauty of Finish, Lustre of Reflector, and power to throw light a great distance, the Lamps of our manufacture stand unrivaled. Testimonials from prominent Railroad Officers all unite in pronouncing our Patent Head Lamp

THE BEST BURNING LIGHT EVER SEEN.

CONDUCTOR LAMPS.

Best Conductor Lamp, with reflector (Nickel, Plated)....	$20 00
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Best Conductor Lamp, of Brass, with Reflector...........	8 00
Best Conductor Lamp, of German Silver, without Reflector,	8 00
Best Conductor Lamp, of Brass, without Reflector.......	6 00
No. 3 Planished Tin and Brass Lamp, Flange Top.........	5 00
No. 5 Egg, Fancy, Pennsylvania R. R. Style...............	3 00
No. 4 American Merchants' Union Express Co. Style.....	3 00
No. 4 Flange Top, New York Central R. R. style.........	2 50

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Boxes for Single Lamps, 25 cts. each. Money to be returned free.

GERMAN SILVER AND BRASS FIRE DEPARTMENT LAMPS.

Firemen's Trumpets of all Styles and Sizes, Made to Order.

Railroad Hand Lanterns of all Colors, &c., &c.

Initials of Roads and Names marked on Glass.

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Have on hand and made to order

SUBMARINE TELEGRAPH CABLES,
INSULATED WIRES, for
TELEGRAPH AND ELECTRIC USE, and for
BLASTING AND MINING PURPOSES,
in every variety desired.

As an Insulation for Telegraph Cables and Electric Conductors GUTTA PERCHA has been universally adopted by all scientific and practical Electricians and Manufacturers of Telegraph Cables and Wires in this country and Europe, and has sustained, with increasing confidence in its superiority, the practical test of over twenty years' general use.

The PROPRIETOR *would say to all parties desiring*

SUBMARINE TELEGRAPH CABLES,

that he will guarantee to make and deliver at his Factory any style of Cable, Insulated with Gutta Percha, as low as they can IMPORT *Cable of the same style and quality.*

ORDERS RECEIVED AT THE FACTORY.

Messrs. L. G. TILLOTSON & CO.,
8 *DEY STREET, NEW YORK,*
AND
BLISS, TILLOTSON & CO.
247 So. Water St., Chicago, Ill.,

have been appointed by me GENERAL AGENTS for the sale of any Telegraph Cable or Wire manufactured at the Works in New York, at Factory Prices, delivered in New York.

JOHN THORNLEY, 503 Chestnut St., Philadelphia, has been appointed Agent for the sale of any and all goods manufactured by me, at Factory Prices, delivered in New York.

Any goods of my manufacture (*except Telegraph Goods*), are for sale in New York, by

H. G. NORTON & CO., 26 Park Place,
RUBBER CLOTHING CO., 347 Broadway
D. HODGMAN, 27 Maiden Lane.

SAMUEL C. BISHOP

OFFICE AT FACTORY.

POLHEMUS & LANDIS, Printers and Stationers 102 Nassau Street.

JOURNAL OF THE TELEGRAPH.

VOL. IV. NO. 13. NEW YORK, JUNE 1, 1871. WHOLE NO. 86

THE INAUGURATION.

Saturday, June 10, 1871.

The arrangements for the inauguration of the Morse Statue have now been fully completed, and we accordingly make the announcement of the day's programme. Before doing so we give the following polite letter, sent us by the Commissioners of the Central Park, which left us free to make the final announcements:

CITY OF NEW YORK,
DEPARTMENT OF PUBLIC PARKS,
May 15, 1871.

JAMES D. REID, Esq., Chairman, &c.

Dear Sir: June 10, at 3 or 4 P. M., will be satisfactory to us, and your plans for platforms submitted are approved.

Directions will be given to Superintendent Crane to give every facility in his power, and our park keepers will co-operate in carrying any special arrangement desired into effect.

Respectfully yours,
HENRY HILTON, Treasurer.

We have also the gratification to announce that, through the kindness of Gen. Davis, military commander of the port of New York, the fine U. S. Army band, stationed at Governor's Island, has been, in the handsomest manner, placed at the service of the Inaugural Committee.

INAUGURAL CEREMONIES.

NEW YORK CENTRAL PARK, AT PRECISELY 4 P. M.,

His Excellency GOVERNOR HOFFMAN presiding.

1. Music by the Band.
2. Introductory Address by Governor Hoffman.
3. Unveiling of the Statue by His Excellency Governor Claflin, of Massachusetts, and Hon. William Orton.
4. Music.
5. Inaugural Address: William Cullen Bryant.
6. Reception of the Statue by Hon. A. Oakey Hall, Mayor of the City of New York.
7. Music.
8. Invocatory Prayer, by Rev. Stephen H. Tyng, D. D., Rector of St. George's, N. Y.
9. Doxology, by band and people.

Inaugural Committee: W. G. Hunt, Esq., C. W. Field, Esq., Gen. T. T. Eckert.

RECEPTION.

ACADEMY OF MUSIC.

COMMENCING PROMPTLY AT ¼ BEFORE 8 P. M.

President—Hon. WILLIAM ORTON.

Vice-Presidents.

Hon. A. Oakey Hall,
Hon. E. D. Morgan,
Hon. W. E. Dodge,
Hon. William Kelly,
Hon. Ezra Cornell,
Cyrus W. Field, Esq.,
W. H. Aspinwall, Esq.,
C. H. McCormick, Esq.,
Geo. H. Thurston, Esq.,
Geo. Granville White, Esq.,
Governor Bullock, of Ga.,
Governor Jewell, of Conn.,
Moses Taylor, Esq.,
Peter Cooper, Esq.,
Geo. B. Prescott, Esq.,
W. Cullen Bryant, Esq.,
Geo. Walker, Esq.,
A. B. Cornell, Esq.,
Wilson G. Hunt, Esq.,
M. O. Roberts, Esq.,
A. A. Low, Esq.,
Gen. E. S. Sanford,
C. Livingston, Esq.,
Gen. Anson Stager,
Gen. Jeff. C. Davis,
C. Rathbone, Esq.,
Hugh Allan, Esq.,
Hon. W. H. Kent,
S. B. Chittenden, Esq.,
W. B. Dinsmore, Esq.,
W. B. Ogden, Esq.,
Howard Potter, Esq.,
Hiram Sibley, Esq.,
J. H. Wade, Esq.,
Hon. Sam. Sloan,
Lewis Roberts, Esq.,
E. H. Vankleeck, Esq.,
O. H. Palmer, Esq.,
Maj. Gen. Joseph Hooker,
Maj. Gen. McDowell,
A. T. Stewart, Esq.,
Hon. John A. Griswold,
Gen. Marshall Lefferts.
W. E. Dodge, Jr., Esq.,
James Stokes, Esq.,
A. S. Hewitt, Esq.,
James Lennox, Esq.,
P. C. Cornell, Esq.,
E. Creighton, Esq.,
Gen. T. T. Eckert.

Committee of Arrangements.

Gen. Marshall Lefferts, Chairman.

John Horn, Jr., W. K. Applebaugh, J. W. Burnham, W. I. Reid.

1. Music by the U. S. Army Band.
2. Invocation by Rev. Howard Crosby, D. D., Chancellor of the University of New York.
3. Introductory Address by Hon. William Orton.
4. Geo. B. Loring, Esq. Theme, "The Telegraph and International Intercourse."
5. Music.
6. G. W. Sampson, D. D., President Columbia College, Washington. Theme, "The Telegraph and Literature."
7. Music.
8. At 9 P. M. a message will be sent conveying a brief sentiment from Professor Morse, to which he will *personally* manipulate his name, and which, it is designed, will be received the same instant by all the cities of the United States and Canadas. Electrical arrangement under direction of Geo. B. Prescott, Esq., Electrician.
9. Responses from principal cities, and from Europe, Africa and Asia.
10. Address by General Banks. Theme, "The Telegraph as a National Defense."
11. Address by Rev. H. M. Gallaher: "The Telegraph and Christianity."
12. Poem by J. W. Watson, Esq., author of "The Beautiful Snow."
13. Address on behalf of the Telegraph Operators, by G. K. Walcott, Esq.
14. On behalf of the Ladies of the Telegraph.—James D. Reid
15. Address of Governor Hoffman to Professor Morse.
16. Professor Morse's reply.
17. Benedictory Prayer by Rev. Henry Ward Beecher.

After which the operators present and friends will be introduced to Professor Morse.

Operators Committee of Reception.

W. K. Applebaugh,
Gerrit Smith,
Fred T. Bickford,
C. E. Higdon,
R. B. Lown,
F. H. Seibert,
T. Carter,
P. T. Hauff,
C. J. Ryan.

Free tickets for reserved seats at the Academy of Music, will be sent on application to me by telegraph or otherwise. Seats will be regarded as surrendered, if not occupied by 7:45 P. M. The plaster cast of the statue will be erected on the platform.

JAMES D. REID, Chairman,
145 Broadway, N. Y.

TELEGRAPHIC EXAMINATIONS IN THE NETHERLANDS.

We cannot forbear printing the following very intelligent letter, just received. It is the work of a man who ought to do well. We print it entire because it reveals throughout a precision and thoroughness and minuteness which is characteristic of thorough training and discipline. The examination is especially interesting:

NETHERLANDS, April 4, 1871.

To the Western Union Telegraph Company:

MESSIEURS: The writer of this letter is a telegraphist at the State's office at ————. He should like to emigrate to America, in order to get there a similar position.

His name is ——— ————; he was born in the Netherlands, 23 years old, and a member of the Protestant Church.

Before he became a telegraphist he was a teacher, and as such he has passed the examination as usher and as French master before the Provincial State's Commission.

After having been in military service (as a militiaman), he disliked the profession of teacher, and resolved to apply to the telegraph.

In March, 1870, he became clerk at the State's Telegraph of the Netherlands, after an examination of 140 competitors, by which he got number one of the twenty persons who were nominated.

After another competitive examination in May, 1870, of forty-seven competitors, he got No. 2 of the eighteen persons appointed as apprentice-telegraphists.

He has added to this letter the programme of this examination, as it is printed in the official newspaper.

From the 21st to the 24th December, 1870, he has a third time undergone an examination of thirty-five competitors; fifteen were appointed as telegraphists, third class, among whom he got No. 6.

At all these nominations the nominated are arranged according to their abilities.

He has also added hereto the programme of this last examination, as it is to be found in the "Printed Circular Letters" of the Chief Administration of the Dutch State's Telegraph.

The principal reason for which he wishes to emigrate is the little chance of promotion he has in his present condition. His salary now amounts to 300f. At the present rate of promotion he may have 1,000 or 1,100 guilders within three or four years, and only after fourteen or fifteen years he will have a chance to be appointed as director or under director at a salary of 1,500f.—£125—equal to $600.

The aim of this letter is to ask what documents and certificates he must produce to be engaged by the Western Union Telegraph Co.

Of course his emigration is a step of such importance that he hopes he will be allowed to put here the following questions:

1. What will be the amount of his fixed annual salary?

2. What is the chance of promotion for him?

3. How many hours, on an average, shall he have to work every day?

4. In what part of the United States (State or city) shall he *probably* be stationed?

5. Shall he receive a gratification for the passage?

Perhaps, Messieurs, you will mistrust his abilities, because it is so short a time since he entered the telegraphical service; but exactly for this reason, as the examinations he passed are still of recent date, he thinks them to be a warranty of his fitness. It often occurs that old functionaries have almost entirely forgotten the knowledge required to pass the examinations, wherefore the Dutch Administration has introduced a new examination for all the functionaries wishing to be promoted to telegraphist 2d class, 1st class, director, and so forth,

Hoping this effort to get a better situation in the world will be received with the sympathy that warrants its success, he has the honor to be

Your obedient servant,

Programme for the examination of those who wish to become Apprentice-Telegraphists.

DEPARTMENT OF FINANCE,
Nederlandsche Staatscourant, No. 56, 6-7 March, 1870.

The Minister of Finance communicates:

1. In order to get a place as telegraphist at the State's Telegraph, a number of, at most, eighteen apprentices will be admitted to the courses of telegraphy held at Amsterdam, after having passed a competitive examination.

2. These apprentices will enjoy a salary of a guilder a day, and, after having given sufficient proofs of fitness, they may aspire after a place of telegraphist 3d class, with a salary of 800 guilders a year.

3. Those who wish to undergo the examination mentioned, sub. 1, are invited to present themselves for that purpose at the Department of Finances, with a request, to which must be added the documents proving that the candidate is:

a. Netherlander, born in one of the years 1845 to 1852.

b. Of an irreprehensible conduct; therefore they have to produce a declaration, laid over by the administration, of the candidate's fixed dwelling place.

4. The examination will be held at the Hague.

5. The candidates must be of a healthful constitution and without bodily defects; especially their organs of sight and hearing must be in good condition, all what will be examined by a physician pointed out by the Minister.

6. The examination, sub. 1, embraces the following abilities:

a. A quick, clear, and elegant writing.

b. The Dutch language; a composition on some subject, of sound contents, of a good style, and without grammatical faults.

c. The French, English, and German languages; the candidates must be able to express their thoughts and ideas in those languages without difficulty; to translate Dutch pieces in each of them without grammatical faults; and to explain the principal grammatical rules.

d. The first principles of arithmetic, including the doctrine of proportions, common and decimal fractions, the metrical system of weights and measures.

e. The rudiments of algebra, as far as the quadratic equations included.

f. The rudiments of geometry, as far as the calculation of the contents of surfaces. (La planiometrie.)

g. The first principles of geometrical drawing.

h. Geography—the situation of States and the principal towns.

The candidates must be able to employ the knowledges called sub. *d*, *e*, and *f*, in resolving problems of little intricacy.

VAN BOSSE,
The Minister of Finance.

The Hague, 4th March, 1870.

Programme of the Third Examination of the 21–24 *December*, 1870.

Programme for the examination of the apprentice-telegraphists who wish to obtain a place as telegraphists 3d class (extracted from the Circular Letters of the Chief Administration of the Dutch States' Telegraphs).

Magnetism—Influence of magnets on each other; magnetism of the earth; difference between statical and dynamical electricity.

Inconstant and Constant Batteries—Different arrangement of the elements of a battery.

The Law of Ohm.

Electro-Magnetism; Galvanometer; Multiplicator; Magnetising by Galvanic Currents; Electro-Magnets and their different forms; Remnant Magnetism; Proportion of the Resistance of the Enveloping Thread of the Electro-Magnet to that of the whole Chain.

Galvanic Polarization.

Atmospherical Electricity.

Lightning Conductors.

Intensity of the Current; Electromotorial Force and Resistance of the Batteries; Conductability of Metals and Fluids; Rheostate; the Application of the different manners of arranging the Elements of a Battery, in order to obtain either the greatest intensity or the greatest quantity of the Current; Batteries serving for many lines at the same time.

The Earth, as Conductor, employed in Telegraphy; the Plates constituting the Junction of Line and Earth.

The different manners on which the Currents are led and the different Apparatus are united in the office itself; the Chest in which the Lines and Apparatus are united; the Commutator that forms the Conjunction of the Batteries and the Apparatus; Lightning Conductors in the interior of the office; different Galvanometers employed by the States' Telegraph; construction of the keys of the instrument with which the transmission is done, and of which I didn't know the name in English; Relays; the Morse Apparatus and its modifications; the Commutator interpolated between the different parts of the apparatus: the line, galvanometer, etc.; the commutator by which an opposite direction may be given to the stream passing the apparatus; the construction, the use, the manner of regulating and conjoining of the different parts of the apparatus; the different ways taken by the current in the different apparatus; in the apparatus forming the head of the line; in the apparatus uniting two sections of the line, and in the apparatus that is to be employed as translateur; construction of the large commutator with which all the translateurs are united; relays; translateurs; awakers; knowledge of the Dutch map of telegraphs; destination and conjunction of the lines; denomination of the sections of the lines; the different directions in which despatches to the Dutch telegraph stations are to be sent; the divisions belonging under the direction of each of the line inspectors.

A good and quick sending; reading quickly and exactly from the band; knowledge of the prescriptions for the general direction of the States' telegraphs; mutual relation between the functionaries and the servants of the offices and the directors; line inspectors and the chief direction; the regulation of the interior service of the offices; what is to be done by the functionaries in case of indisposition; general notions of the relation between the functionaries of the States' telegraphs and those of the "Administration of the Waters," and those of private telegraph companies, in as much as regards the keeping in repair and observation of the lines; all what regards the account of the receipts and expenses of the States' telegraph offices.

The regulation of the service at the States' telegraphs; the treaties and prescriptions on the exchange of dispatches concluded between the Netherlands and other States, or private telegraph companies; the particular instructions for the refusal of despatches or revelation of their contents; the instructions given by the Minister of Finances on the co-operation of the post and telegraph; instructions for the transporting of meterological despatches.

Knowledge of the situation of the principal telegraph offices in the world, and their names in other languages; States and companies, the regulations of which deviate from the general treaties; frontier places; vias by which the despatches are sent to the different States, and by-ways by which they are sent in case of interruption; the calculation of the prices in these two cases.

NEW METHOD OF ELECTRICALLY EXPLODING TORPEDOES.

The progress of the torpedo question having hitherto been carefully noted in our colums, it is natural that our readers should expect to find any new feature in that direction discussed by us. We, therefore, have now to record another step in the right direction, which has been made by Captain Andrew Noble, who has done so very much in promoting the science of gunnery. It is pretty generally known that hitherto it has been the practice, in the arrangement of submarine torpedoes, to connect every mine with the firing battery or other electrical exploding agency, by means of a distinct insulated wire, or cable. Captain Noble, however, uses but one cable for the explosion of any number of torpedoes, and the manner in which he effects this is as follows: The insulated cable is connected with a number of branch insulated wires corresponding to the number of torpedoes which are to be laid down. These torpedoes are so constructed that any one of them is exploded when struck by a passing ship, by the completion of an electric circuit through the insulated wire. Upon the explosion of any one of the torpedoes, it is at the same instant disconnected from the electrical arrangement, so that its explosion in no way interferes with the liability of any one of the other torpedoes to be subsequently exploded by collision with a vessel. In practice, Captain Noble makes the electrical communication between each torpedo and the insulated wire through an Abel fuze, which, together with the joints which connect it with the torpedo, and the insulated cable, is enclosed in a water-tight insulating casing. When the torpedo is exploded by completing the electric circuit, the fuze enclosed in the insulating box is simultaneously exploded thereby, and the electric communication of that particular torpedo with the insulated wire is instantaneously severed. The same result is also obtained by Captain Noble with a platinum or fine iron wire, or any other electrical fuze in place of the Abel fuze, the special points of the invention—which has been patented—being the electrical explosion of one or a series of torpedoes without disturbing the rest, and the severance of electrical communication by means of the insulating casing.

We publish the following by request. Some details are omitted, but the material parts preserved:

THE FIRE ALARM TELEGRAPH OF NEW YORK CITY.

BY PROFESSOR MORTON.

Lines.

These are so built that only a few stations are embraced in each, and they are so interwoven that contiguous stations are upon different lines, so that an injury to one line, which might put one station out of order, would have no effect upon the next nearest station—because that one would be placed in connection with a distinct and separate line. The wires are very strong, and of unusually high conductibility, so that the currents of electricity may flow through without impediment. The various lines extending from the Battery to Spuyten Duyvil all finally converge at the Central Office; one end of each of the fifty-six coming in from the North and the other end of each from the South.

Instruments.

The instruments and appliances at the Central Office consist of batteries, switch-board, register or receiver, indicator, transmitters, clock, repeater, and testing apparatus. The apparatus outside of the Central Office consist of automatic street signal boxes and mechanical gong strikers. All of these instruments are of the most perfect and elaborate construction, and most of them especially invented, designed, and made for the service of the complete system.

Batteries.

These are compactly arranged in series of shelves, so as to be easily accessible. The shelves and stands are very thoroughly insulated, and the peculiar form of the battery keeps it perfectly clean and dry. The zinc element of this battery is so formed as to make a cover to the glass jar, and thus prevent evaporation and the introduction of foreign matter in the interior. All batteries give off currents of electricity of various power, according to the amount of chemical substances destroyed—but they are almost universally constructed so that the plates are plunged into a reservoir of acids or chemicals, which act directly upon the plates, unles labor is expended upon them to keep them protected, or upon the other parts of the battery to keep them clean. There is thus a large amount of destruction of material independent of that due to the evolution of electric force. This destruction is called local action. If this abnormal action can be guarded against, two beneficial results ensue—economy of material is secured, and constancy of electric force and incidental labor is saved. The constancy of force is a very great consideration in a system where, for the first time, is introduced apparatus for the exact and instant measurement of electric force on every line. The experiments to secure this evenness of power and small consumption of material were carried on for more than a year upon the old lines of the New York fire telegraph. For more than twelve months a steady current was supplied by means of these batteries—the only labor required being the occasional supply of crystals. Without describing any other features of the battery, it may be simply said that the principle of the long endurance is found in the arrangement by which a steady but minute supply of active chemical is supplied continually; the supply is regulated to the requirements of the line. Only one-tenth of the expenditure of chemicals and labor are required. As it has been considered the best policy to keep the entire system of lines in a state of continuous and simple inter-communication, and as the expense of sustaining such batteries has been so much reduced, a very large number of cups are maintained, which, if extended, would occupy nine hundred feet in length. Beside these batteries others are provided for special purposes. The wires leading from these batteries are carried into the operating room symmetrically, and with a view to their easy and instant identification.

The Switch Board.

In all cases where many wires carry electrical currents into offices it becomes necessary at times to change the direction of these currents—to transfer them from one wire to another for various purposes, just as an engine and train of cars are diverted from one track to another. The same name is given to these devices, viz., "switch." When many wires are introduced, each requiring its switches for its various purposes, the assemblage is called a "switch-board." That of the New York fire alarm is superbly mounted, is nine feet in length, and has upon it upwards of five hundred switches, each performing its own special duty—but also arranged and grouped together so that very many may be moved by one common impulse, as when it is required to convert certain series on the entire number of lines from receiving to transmitting lines.

Galvanometers.

These are instruments which measure the force of current on the line by deflection of a needle. A few degrees indicate a weak current, and many degrees a strong one. It is thus a valuable register of the state of the line—for the normal condition of the line being twenty degrees, ten degrees would indicate that the battery was becoming weak, and forty degrees would indicate that the battery was becoming stronger, which could not easily occur, or else that resistance at the line was lessened, or that the current had found some short road easier for it to travel than through all the length of the line, with its numerous magnets. This measurement by degrees would be only a partial indication of the state of things. Hence to every one of these galvanometers is added that which makes the test an exact one. The "resistance" of a circuit or line is that obstacle it presents to the free passage of the electric current. Through a short circuit of large wire a large volume of electricity will pass and exercise powerful force upon magnetic instruments. Through a long circuit of fine wire the reverse is the case. Suppose a line five miles in length has included in it ten magnets, each of them being furnished with wire a mile long—or, as it is called, a mile "resistance"—the whole resistance would then be fifteen miles; but, if the current, instead of passing through all this length, proceed only two miles, and through only five magnets, and then gets back again, it is evident that it meets with only seven miles of resistance instead of fifteen. Hence we can often locate a trouble if we know the exact resistance of a line and compare it with the normal resistance of that line when all is in proper working order.

The Register or Receiving Instrument.

This is the apparatus by which are recorded all the alarms that are sent into the Central Office, and all the tests of the day and night. The currents from the lines do not immediately proceed to this machine, but through the usual intervention of the relay magnet, of which fifty-six, in very compact form, are arranged upon the register-table. These relays act upon the register, and also, at the same time, upon an electric annunciator, by which the number of the line is indicated. When a signal is communicated to the Central Office from a street box, the first operation the box performs is to disturb and break up the current that steadily flows through the line at all times, and holds the relay magnet steadily charged. This break discharges the little magnet, its lever falls back, and, in so doing, instantly performs four operations. First, it throws down into view the number of the line called into action; it causes a bell to be rung; it starts the register wheel-work into revolution, and it prints a dot in ink upon a broad band of paper, which is rolled through the machine. If this single action was all that took place a single dot would be printed on the paper, which would run out about three inches and then the revolution would instantly cease, but it can be arranged that the paper shall run only two inches, more or less, before it stops. As long, however, as the line continues to be active by sending off signals, just so long will the paper keep running—always stopping, however, two inches, more or less, as adjusted, after the very last impulse from the line. This paper roll is about ten inches wide. Fifty-six pens, actuated by fifty-six magnets, are arranged beneath it, so that each and every one may be brought to bear upon the paper. Each one is connected with a separate line. The pens are numbered to correspond with the lines from one to fifty-six.

Suppose that the signal 256 is to be sent in. The street box which sends this particular signal is one of those connected with line No. 21. The operation then, of the bringing that box into action is, first, to start the paper roll into movement, and to throw into sight No. 21, to call into action the twenty-first pen, which, with great exactness, prints the signal 256 in ink upon the paper five times, and then the paper stops itself two inches after the last printed dot. Thus every signal sent over any of the lines is printed upon this same roll of paper either day or night. But the paper also records clearly another signal, which is automatic. A very fine regulating clock is suspended on the wall of the office. Precisely at each hour on the beat of the first second a type corresponding with the hour of the day strikes upon the paper roll and prints it. In the daytime the hour figures are different from those indicating the night hours. At the same moment a small bell is started, ringing continuously, notifying the operator in charge that the hour has come, and that he must proceed to test all his lines, and print the record that he has done so upon the paper. His duty is then to open for an instant each and every key on each and every line. These keys being arranged in groups of eight, may be struck in groups or singly. The single touch of all these keys makes upon the register paper fifty-six dots corresponding with the fifty-six lines; and if no alarm of fire should come in to be recorded on the same paper, on any one of the lines, then, at the commencement of the next hour, it would be printed in the same way as before on the paper, and another series of tests would be made. Thus, at the end of a day's operations the paper would show that, between the striking of every hour day and night, every line had been tested and its good condition recorded upon paper; or, if its pen failed to make a record, explanation of the cause would be sought for and the difficulty obviated. Whatever fire might occur between any hours would be also recorded in its appropriate place, and the paper thus becomes a record of the locality of every fire, the time that it occurred, and also the sound condition of all the lines. The clock which serves to actuate the printing of the hours upon the paper, can also be made easily, by the agency of certain switches, to strike the precise commencement of any hour upon each or all of the six hundred stations embraced in the entire system. In direct connection with this register, and the supplementary apparatus through the medium of the wires are the

Street Boxes.

These boxes form, of course, a very important part of the apparatus of the system. They are fastened to the poles or engine-houses, and consist of an outer casing or house of iron, with the seal of the Metropolitan Fire Department on each, and a label covered with glass indicating to the public where the key which opens the box may be found. Every policeman is also furnished with a key, and every fireman, and the insurance patrol. When a fire occurs in the neighborhood of a box, any one who first obtains the key opens the outer box. Within it he perceives a second iron box, and, fastened to it, a handle to be pulled down. Printed directions are also visible, to guide in doing this simple thing in the right way, and also showing how it may be known that pulling the handle has been effective. The moment the opener of a box hears a response, he knows that his work is done. The officers in the department, who have keys for the inner box, to which the handle is fastened, discover, upon opening them, a third box, round, and tightly closed up from the air. On the outside of this third box is to be seen simply a brass arm, extending out to the right. The brass arm is fastened to the apparatus within the round box. The office of the pulling-down handle on the second box is to engage with and pull down this brass arm.

The action upon the arm winds up the machine within which begins running down as soon as the brass arm is left free to move by the disengagement of the pulling-down handle.

Opening the round box (previously, however, removing the brass arm), within is found a very excellently finished piece of clock-work, driven by a spring, which is so attached outside of the frame that, if it breaks, another can be supplied without pulling the frame to pieces. The arm winds up the machine like a watch, but only a short distance. It begins to run down, and, in doing so, as the movement is controlled by a perfect regulator, one of the wheels of the trains carries a "circuit-wheel," with teeth cut on it corresponding with the particular number signal which the iron box represents. The office of the regulated clock-work is to carry this circuit-wheel very steadily and slowly around from one to five times, as it is set. Each time it revolves its teeth strike upon springs, and the circuit is made to open and close correspondingly. Two teeth, a space, then three teeth and another space, and then four teeth and a long space, would cause the circuit to be opened and closed so as to ring out the number 234. As every box has a circuit-wheel with a different number, the starting of the machine of any box communicates its special number with certainty, five times repeated, to the Central Office, and it is printed on the paper of the register five times. In addition to this machine, the second box contains a magnetic bell, which rings in accordance with the signal sent, and thus becomes an indicator that the message is going correctly to the Central Office; it also receives the return signal from the Central Office, and any and every desired signal which is sent out from that place. There is also a telegraph-key, by which messages, if necessary, may be sent; also a lightning-arrester; also a simple arrangement which, turned either right or left, divides the line into two parts, so that, if any accident should occur to interrupt the continuity of the circuit, preventing the current from going to or returning from the Central Office, the uninjured part of the line may be almost immediately utilized, and, instead of having ten boxes thrown out of use, the loss may be reduced to a single one. Thus a fire may burn down a pole or break a wire, but in a very few minutes the accident is known, and the line which has been broken is made into two short ones, until the time when it becomes practicable to re-unite the broken ends.

The other principal receiving instruments in the Office consist of two extra and ordinary registers, by which the communications with the boxes which may be necessary for keeping the lines in perfect repair and good order are carried on, so as not to allow the main register to be cumbered by them. The apparatus for *sending out* the fire signals, received from and through the machines just described, consist of the repeater, the supplementary repeater, and the mechanical gong-strikers.—*Journal of the Franklin Institute.*

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A TUBULAR POST.

The slowness and irregularity of City postal delivery are themes of frequent complaint. These complaints are not always just, and at any rate there has been of late such a decided improvement as to warrant congratulation. At the same time, the increasing obstruction of our streets, and the constantly swelling proportions of the city mails, tend to magnify the evil complained of. In London a device has been adopted which is designed to avoid the last-named difficulties, and which certainly, if it works well in practice, will be a great public convenience. Some large iron pipes have been laid from the General Post-office at St. Martin's-le-Grand to the chief branch office at Charing-cross. Through these pipes bundles of letters are blown in either direction, at pleasure, by compressed air; and thus it is hoped an immense amount of travel and manual labor may in future be dispensed with, while an important gain is effected in the matter of time.

This experiment is no new thing, although it has never before been tried on so large a scale. It has long been employed by the Electric and International Telegraph Company. Eighteen years ago, Mr. Latimer Clark laid down tubes from the central office of the Company in Lothbury, to the Telegraph stations in Mincing Lane and Cornhill. A steam-engine kept a huge air pump in motion, and from this, regular power was obtained, which drove packages of messages swiftly from point to point. Some practical impediments in the way of friction were easily disposed of, and bundles with gutta-percha covers were kept flying through the tubes at great economy of time and pains. When Mr. C. F. Varley became engineer to the International Telegraph Company, he used compressed air to drive packets to out-stations, and a vacuum to drive them back. He used felt for covers instead of gutta-percha, and planned pneumatic valves, so that the bundles, on reaching the end of their journey, struck a brass button or spring. The spring set a valve to work, the valve opened a door at the end of the passage, and the packet dropped down on a table below. Some may ask, why resort to such an expedient when you have control of telegraphic wires? The reason is that in sending messages very short distances by electric telegraph, there are often grave inconveniences; and these have been explained, and the utility of the tubes demonstrated by an expert operator, in the following manner:

> "Suppose one telegraphic wire be suspended between two stations half a mile apart, and another be suspended between two stations three hundred miles apart; let thirty messages be received all at once for transmission over each of these two wires—it is plain that some of these messages will have to wait half an hour before their turn comes to be signaled over the wire. The public will not complain of a delay of half an hour in the delivery of a message in a town three hundred miles off, but they would make a great outcry if a message took half an hour to go half a mile by the electric telegraph. Therefore, it is the simplest and most expeditious plan for the central telegraph station in a great city to blow the messages bodily through tubes to branch stations not far off; the plan saves time and saves labor."—*N. Y. Times.*

INSCRIPTION FOR THE MORSE MONUMENT.

To the Editor of the Chicago Tribune:

SIR: The following passage of Scripture is suggested as an appropriate inscription for the proposed monument to S. F. B. Morse, in commemoration of his invention of the electric telegraph:

> * * * "And the angel which I saw stand upon the sea, and upon the land, lifted up his hand to Heaven, and swore by him that liveth forever * * * that there should be time no longer."
> —*Revelation (see also connecting verses.)*

Time is measured by the motion of the earth, and when a telegram, starting from London with the sunrise, beats it by three hours into New York, time is nowhere. And when, after years of land telegraphing, the ocean cable was successfully laid, and despatches were sent from one continent to the other, and across them both, then *the Angel of the Telegraph*, striding the land and the sea, did proclaim that (in an important sense) "there should be Time no longer."

Have there been any more literal fulfilments of Scriptural prophesy? And is not the passage quoted eminently fitting for the purpose suggested?

W. B. T.

CHICAGO, May 6, 1871.

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Free tickets for the steamboat excursion will be received June 9 and 10, at the store of L. G. Tillotson & Co., No. 8 Dey street.

Badges will be given at the room of the Committee, 88 Liberty street, and which had better be applied for early after arriving and the names registered.

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When the following came to us we regarded it as out of date and laid it aside, but, on looking at it again, we gladly insert it. It may have been inspired by some personal sorrow, and sorrow is always sacred:

UNKNOWN.

BY L. W. COPELAND.

On the banks of a lonely river,
  In a quiet woodland glade,
With a Southern sky above him,
  A Union boy is laid.
No marble slab is standing
  To record the hero's name,
A little mound is all that shows
  His fortune and his fame.

The sighing trees above him
  Softly whisper as they wave,
Holding out their twining branches
  O'er the unknown soldier's grave.
And the moon comes flickering through them
  With a sad and quiet light,
Watching o'er the unconscious sleeper
  Through the long and dreary night

Unknown—perhaps on picket—
  Some lonely night he fell,
Not dreaming that the wily foe
  Was lurking in the dell.
No comrade near to help him;
  None to hear his dying moan;
None to bear his dying message—
  Death meets him there alone.

Unknown—perhaps some loving wife
  His coming footsteps wait;
But far away from home and friends
  He's met a soldier's fate.
Perhaps some aged mother
  O'er the absent one may weep,
Unconscious that her absent boy
  Has found his last, lone sleep.

God bless and keep the poor ones
  Who are wailing, but in vain,
For the footsteps of the dear ones
  Who will ne'er come home again
Cheer up, ye broken hearted,
  For unto you is given
A promise that, when life is o'er,
  You'll meet them all in heaven.

BRANDON, VT., 1870.

ELECTRIC TIME-GUNS.

The beautiful mirror experiment of Wheatstone has determined the velocity of the electric spark to be upwards of 288,000 miles in a second, a velocity which is greater than that of light, the speed of which may be estimated, from the investigations of Foucault and Fizeau, to be only 196,000 miles per second, a result which but slightly differs from that determined by astronomical observation. We have already taken occasion to point out that, as regards the speed of electrical transmissions through metallic conductors, the resistance of the wire in a great measure tends practically to limit this enormous velocity—that is, that the mechanical imperfections of material and construction in our telegraphic circuits present so much material resistance that the speed becomes reduced to that at which consecutive currents can be transmitted without coalescing together. For the practical purposes of the telegraph and time-gun this speed may almost be considered instantaneous. The city of Edinburgh affords the first example of true Greenwich mean time being announced at a stated hour by an audible example. The arrangements connected with the discharge of the time-gun at Edinburgh are mechanical, not electrical, and may be described as follows: Placed on the ramparts of the castle, and in the immediate vicinity of the gun, is a clock, the movement of which is under electric control from the Royal Observatory clock on the Calton Hill, a wire extending over the city from the Royal Observatory to the castle. The castle clock indicates, therefore, the exact time of the observatory clock, beat for beat. Attached to the movement of the castle clock is a detent and lever arrangement, which is mechanically liberated by the mechanism of the clock at the precise moment necessary for the discharge of the gun. This is accomplished by the fall of the lever pulling a cord attached to a friction tube placed in the touch-hole of the gun. The accuracy with which this arrangement has been adjusted by Professor Piazzi Smyth, the Astronomer Royal for Scotland, is such that a failure in the discharge of the gun rarely occurs, and certainly the value of an audible time signal can nowhere be more fully demonstrated than by reference to the accurate time kept in that city, in place of the miserable discrepancies that most usually are found to exist in cities and towns between church clocks and watches—a variation at times so wide as to frequently cause endless annoyances in loss of time and punctuality of appointments. The daily one o'clock time-gun signal in Edinburgh alike controls the accuracy of railway, church, and watch time pieces, and at every corner the accuracy of the local time registers may be trusted. Perhaps in no other city in the world is time so accurately kept as in Edinburgh; certainly in London we have no means of indicating time with accuracy to the tenth of a second, available to the general mass of the inhabitants. Taking even the standard clocks in our public buildings, and comparing the time one with another, how frequently grave discrepancies are apparent; but even were they tolerably accurate, none of them show true time to a second—no means exists in London available to the mass for the accurate adjustment of a watch. It will even be found that the "regulators" of the chronometer makers vary from one another some three or four seconds, as measured by the standard of Greenwich mean time—a standard obtained only by observation, and certainly available for any practical result to very few. In 1863, during the meeting of the British Association in Newcastle-upon-Tyne, Mr. Nathaniel J. Holmes conceived the idea, and, in conjunction with Professor Piazzi Smyth, practically carried out the first electrical time-gun, giving true Greenwich mean time, by the passing of an electric current direct from the Royal Observatory, Edinburgh, to the touch-hole of the gun. The mode of firing this gun differed, therefore, from that of the Edinburgh time-gun by discarding all mechanical contrivances, and igniting the charge by the passing of the electric spark direct into the fuse, the precise moment of discharge being under control of the Observatory clock, 120 miles distant. Practically, it was found that the time taken from the passing of the current to the ignition of the powder and discharge of the gun was about one-tenth of a second, an interval so inappreciably small as virtually to be of no importance. The electric time-guns of Newcastle and North Shields have been organized by special grants, and now regularly fire daily at one o'clock P. M., the electric current being passed from the Royal Observatory, Greenwich. It is not only in the immediate vicinity of the gun that the signal is of value. The sound travels over a radius of some ten miles, and, by allowing a correction for sound—one second for each quarter of a mile, the signal becomes equally available as a time register for the surrounding district. The establishment by Mr. Holmes of four electric time-guns, simultaneously fired from Edinburgh, in Glasgow and Greenock, points out how practically the arrangements were carried out.—*Mechanics' Magazine.*

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CABLES TO CHINA.

From Engineering

The completion of the Singapore-Penang, cable at once brought England into direct communication with the important points of Penang, Singapore, Batavia and the various Straits settlements, and the further extensions, of which we are now about to speak, will bring our most distant colonies in direct telegraphic communication with us at home.

These further extensions are the China Submarine Company's cable from Singapore to Hong Kong, the Australian Company's cable from Java to Australia (Port Darwin), and the Great Northern Company's China and Japan Extension from Hong Kong to Shanghai, and from Shanghai to Possietta, and also to Japan.

We will take these in the order they stand, dealing first with the China Submarine Company. The total length of cable manufactured is 1632 knots, divided into two sections: Singapore to Cochin China, 778 knots; and Cochin China to Hong Kong, 854 knots—1,632 knots.

The total length is subdivided into the following types:

	Knots.
Shore ends	70
Intermediate	305
Main cable	1,257
Total	1,631

The core of this cable is similar to that of the Australian cable, consisting of Willoughby Smith's improved gutta-percha, and having a conductor of the weight of 107 lb. to the knot, insulated to the weight of 140 lb. of gutta-percha to the knot.

The completed cable gave a resistance of conductor equal to 94 per cent. of the conductivity of pure copper, and the insulation resistance was 200 million units, at the temperature of 75 degrees Fahr., the capacity (in which lies the improvement in this core) was as low as .285 microfarads, showing an improvement of about 20 per cent. over ordinary gutta-percha.

The gross weight of this cable amounted in round numbers to 5,000 tons. From this it may be seen how important submarine telegraphy has become to the shipping interests, the two cables we have mentioned having employed as many as eight large steamers in carrying them.

Proceeding now to the Australian Company's cable from Java to Port Darwin, a length of 1,190 knots, but little remains to be said beyond the fact that the manufacture is very nearly completed, and that shipment will shortly commence. Full particulars of the manufacture and description of types appeared in the article we have already referred to, so that it is needless to recapitulate here beyond that the types are similar to those used in the Penang-Madras section of the British-Indian Extension Company's cable.

Of the remaining extension, that from Hong Kong upwards, we shall say but little, the particulars regarding its electrical and mechanical construction appeared in these columns some time since, in a paper read by Mr. Hooper before the British Association. The entire length of this cable, 2,296 knots, has been insulated with india-rubber, or as it is generally known, "Hooper's Material." The first section from Hong Kong to Shanghai has been successfully laid, but we learn by telegram that the cable has not been broken near Hong Kong. The second section, 1,198 knots, has just been shipped at North Woolwich into the Great Northern (just returned from laying the first section), and the Africa, and these vessels will very shortly leave for the completion of this work. This cable was manufactured by Messrs. Siemens for the Hooper's Company, who made the core; the arrangements for laying the cable are, however, in the hands of the company.

The previous cables mentioned were not only manufactured but submerged by the Telegraph Construction and Maintenance Company, who also have the contract for making and laying the uncompleted China and Australian cables.

This notice, therefore, brings us down to the present condition of the submarine telegraph extensions eastward, which promise greatly towards the rapid development of commerce with our colonies and with other points along their routes, and consequently of the great increase of their commercial relations with us.

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Both branches of the City Council of Philadelphia send committees of five each to join in the Morse Inaugural ceremonies and excursion.

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FROM Boston we have a scheme to save time, which we laid aside at first as ludicrous, but yet deserves mention.

All know that the blanks have a heading which bears the date and the address. This forms one-third of the blank. In folding the blank, therefore, it can be so done that the body of the message will be inside, and the address alone exposed.

The idea is, that by a narrow edge of gum or message paper, a message can be at once completed for delivery by the operator, without the necessity of enveloping.

We do not think that envelopes can be dispensed with. They secure privacy. That seems indispensable to telegraphic correspondence.

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WITH regard to the origin of the brilliant colors and varying tints of the Aurora Borealis there is some probability in the conjecture that altitude has something to do with the phenomenon. The aurora is probably due to vast electrical discharges between the positive electricity of the atmosphere and the negative electricity of the earth, the electricities being separated by the action of the sun on equatorial regions. In the lower and denser regions of the atmosphere a white light, and in the more elevated and rarified strata, a violet tint, is most probably the result, much in the same manner as the color of discharges from an ordinary electrical machine may be modified according to the density or rarification of the medium through which the discharge is caused to pass.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 5,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

TERMS:

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Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, JUNE 1, 1871.

THE RESPONSE.

June 10th, at precisely 9 A. M., New York time, Prof. Morse will send a message from the Academy of Music on the occasion of the Testimonial Reception, June 10, addressed to the operators of the Continent. The body of the message will be sent by Miss Marriott, and Mr. Morse will transmit his signature. It is desired that this be received at every office on every circuit throughout the country. It can easily be done by a little co-operation at terminal offices, and we trust it will be given. The message will be brief. It is Mr. Morse's farewell word.

We hope to be able to record that thousands of offices have received it.

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AMERICAN OPERATORS.

There was a time, very distinct in our memory, when to be a telegraph operator was not a title of nobility, and by no means a test of character. This was not wholly so, for in many regions and over some lines, partly by the influence of superintendents, and partly because of the generally elevated tone of the people, the best of men were the early and long trusted workers of the telegraph, and were held in higher honor because of the sacredness of their trust. It was a pursuit which suggested the necessity of intelligent labor, and the first operators of the telegraph were, generally speaking, among the best it has ever employed. When, however, offices began to be multiplied, and rival lines made rapid demands for men to work them, a large number of poorly qualified operators, loose in character, and of minor ability, were brought into the service. Managers of lines built simply on speculation, were not likely to devote much time to discipline or to careful selection of men. And during the war such was the demand of the military service, as well as of the various industries evoked or stimulated by the contest, upon telegraphic labor, that shoals of men were welcomed to the ranks without much enquiry as to their standing or suitability. Ability to handle a key was all that was needed to graduate, and sometimes a very minor ability sufficed.

All this made itself apparent in many ways. In one respect it was productive of much mischief. At the first the management was kind, and in some respects paternal. Superintendents and Presidents of companies conversed freely and encouragingly to their employes. All delighted in the duties connected with this new and wondrous agency. But when this pressure came, and to make rivalry profitable cheap men were in demand, then came iron and unsympathetic rule. The whip and the goad took the place of the directive and stimulating hand. And so shirks and grumblers and baulks, with profanity and drunkenness and blackguardism, swept in.

We believe a great change is sweeping quietly over the whole service. The bad men have either left or are in process of elimination. Thousands of operators move in the best society. Many in the craft are Christian men, presidents of Christian associations, officers and teachers in Sunday schools, well known and honored in the community where they live. With opportunity to discriminate, also, authority has changed its iron rule into kindly vigor. There is evidence everywhere that the entire service is passing into a higher stage. Presently there will be a call for a more positively defined education, a knowledge of fundamental principles, a higher culture. All this will come apace. The telegraph will be more than ever, and more significantly, the highway of thought.

We would have been glad, could the nature of the business have permitted the gathering of a large number of the telegraphers of the country on the occasion of the inauguration of the Morse Statue. It would have aided fraternal feeling, and attached more strongly those who have been speaking together for years without knowing how each other looked. Many, we are glad to know, will enjoy that pleasure. Let as many come as can. The face of a companion in labor is a good thing to see. And let your hands try their vigor when you clasp them.

◆

What Fidelity can do—*The Western Union Telegraph Company.*—Since Mr. W. P. Lucas became manager of the Western Union Telegraph office at this point, two years ago, the business has been increased from one hundred and twenty messages per day, with two operators and two messengers, to upwards of four hundred messages per day, with four operators and four messengers. This does not include the Associated Press telegrams and oil reports. The office has now in working order ten wires, and has lately received and set up an Ottaway switch, with Henning's improvement, which cost three hundred dollars to manufacture. They yesterday completed the construction of a new line, for the New York Pipe Line Co., which extends from Garland to this city, and connects with their batteries. This line will be run conjointly by the two companies. Another branch office will be opened next Monday, at the Oil Exchange in the Parshall Block, and before long an office will be established on Church Run. One wire works direct with the Oil Boards of Trade in Pittsburgh, Philadelphia, and New York. The rates have lately been reduced to a great many points, where lines have been leased out, and consolidations effected with railroad lines. And this branch at least of the Company's lines is in a high state of efficiency.—*Titusville Herald.*

THE STEAMBOAT EXCURSION.

All telegraphers are invited to join our excursion on the 10th of June. Tickets will be furnished at our office on the day previous, or the morning of the excursion. The boat will start from Pavonia Ferry, foot of Chambers street, at 10 A. M.

S. G. Tillotson & Co.,
No. 8 Dey street, N. Y.

◆

In manufactures there is such a constant demand for something new that the best energies of man are severely taxed to meet the requirements of the hour, and it is surprising to many how promptly this craving is satisfied. As an instance of the extending power of the imitator's art, we have noticed that Messrs. Elkington & Co., of Birmington, have arranged to produce, by the electrotype process, imitations of the choicest grains of leather. They say that the system of producing leathers in exact fac simile of morocco, seal, and other skins, by means of electro-deposited copper rollers, has now become an established branch of leather manufacture. The fine grain of the most rare and valuable skins can by this process be reproduced at a merely fractional cost, as compared with the ordinary inferior imitations. The system may be briefly described as follows:—An ordinary machine roller is fitted with a mandrel, upon which is deposited, by a new process, the copper fac simile. The latter is an exact copy of any rare or choice skin required to be reproduced, and it is only by a recent improvement in electrotyping that the difficulty of depositing from such a substance as leather has been surmounted. An ordinary skin can thus be impressed with the beautiful surface of morocco skin, even to the finest variations of grain, and several thousand may be copied by one deposit. In all cases the actual skin required to be copied must be sent. These rollers are supplied ready for the machine; or, if preferred, manufacturers may send their own mandrels and have the fac simile deposited thereon.

◆

The cable boat William Orton has been successfully launched. It will be stationed at the W. Union Telegraph Company's works, 55th street, New York, for cable service, for which it will have every convenience.

◆

NOTES TO BE READ.

Cyrus W. Field, Esq., has kindly given the use of the front room, No. 88 Liberty street, in the rear of 145 Broadway, to the reception committee, where some one will be in attendance during June 9th and 10th, to meet operators from abroad, and where valises or clothing may be left. Badges will be provided there, and it is recommended that these be obtained before the excursion.

In the evening *it is particularly desired that all be seated by* 7:30, at which time the fine band-music will begin, and which will allow the exercises to commence promptly at 7:45.

Tickets for seats are free, and a gentleman or lady will receive a ticket for a companion. As all seats are reserved, requests for seats should be made *at once.*

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
June 1, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since May 15, the date of the last tariff order.

Managers are hereby required to enter these changes into their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

277 Ainsworth, Iowa.
* Albert Lea, Minn.
* Alden, Minn.
* Brownsdale, Minn.
190 Cottonwood Falls, Ks.
57 Cassville Junc., N. Y.
* Delavan, Minn.
* Fountain, Minn.
* Grand Crossing, Minn.
* Grand Meadow, Minn.
130 Hickory, Pa. Check Titusville, Pa.
* Huntertown, Ind.
67 Hubbardsville, N. Y.
* Hokah, Minn.
* Houston, Minn.
68 Lehigh Colliery, Pa.
* La Grange, Ind.
* Lima, Ind.
* Mt. Pleasant, N. Y.
* Mt. Upton, N. Y.
Napa, White Sulphur Springs, Cal. Tariff same as Calistoga, Cal.
* Olive Bridge, N. Y.
466 Osage City, Ks.
* Oakland, Minn.
263 Pewee Valley, Ky.
228 Quitman, Ga. Re-opened.
130 Relay Station, Pa. Check Titusville, Pa.
* Rushford, Minn.
* Ramsey, Minn.
331 Rienzi, Miss. Reopened.
* Spring Valley, Minn.
263 Simpsonville.
* Summit Hill, Pa.
St. Helena, Cal. Tariff same as Calistoga, Cal.
59 Swarthmore, Pa.
74 Stiles, N. Y.
67 West Winfield, N. Y.
* Whalan, Minn.
* Wells, Minn.
* Winnebago City, Minn.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Albert Lea, Minn.,	140	9	Milwaukee or Janesville, Wis., ck. Chicago.
Alden, Minn.,	140	9	Milwaukee or Janesville, Wis., ck. Chicago.
Brownsdale, Minn.,	135	9	Milwaukee or Janesville, Wis., ck. Chicago.
Delavan, Minn.,	145	9	Milwaukee or Janesville, Wis., ck. Chicago.
Fountain, Minn.,	125	8	Milwaukee or Janesville, Wis., ck. Chicago.
Grand Crossing, Minn.,	110	7	Milwaukee or Janesville, Wis., ck. Chicago.
Grand Meadow, Minn.,	130	8	Milwaukee or Janesville, Wis., ck. Chicago.
Huntertown, Ind.,	65	4	Kalamazoo, Mich.
Hokah, Minn.,	110	7	Milwaukee or Janesville, Wis., ck. Chicago.
Houston, Minn.,	115	8	Milwaukee or Janesville, Wis., ck. Chicago.
La Grange, Ind.,	50	3	Kalamazoo, Mich.
Lima, Ind.,	40	3	" "
Mt. Upton, N. Y.,	25	2	Norwich, N. Y.
Mount Pleasant, N. Y.,	35	2	Rondout, N. Y.
Olive Bridge, "	30	2	" "
Oakland, Minn.,	135	9	Milwaukee or Janesville, Wis., ck. Chicago.
Rushford, Minn.,	120	8	Milwaukee or Janesville, Wis., ck. Chicago.
Ramsey, Minn.,	135	9	Milwaukee or Janesville, Wis., ck. Chicago.
Spring Valley, Minn.,	130	8	Milwaukee or Janesville, Wis., ck. Chicago.
Summit Hill, Pa.,	25	2	Mauch Chunk, Pa.
Whalan, Minn.,	120	8	Milwaukee or Janesville, Wis., ck. Chicago.
Wells, "	145	9	Milwaukee or Janesville, Wis., ck. Chicago.
Winnebago City, Minn.,	150	10	Milwaukee or Janesville, Wis., ck. Chicago.

OFFICES CLOSED.

Ackworth, Ga.; Bradley, Mich.; Chickamauga, Tenn.; Gap, Pa.; Spencer Springs, N. Y.; and Stanwood, Mich.

GENERAL INFORMATION.

The following named offices will hereafter be checked direct. Tariff will be as indicated by the squares:

410 Alden, Iowa.
464 Blair, Neb.
444 Cherokee, Iowa.
463 Lemars, "
436 Manson, "
436 Marvin, "
463 Marcus, "
444 Newell, "
473 Onawa, Iowa.
425 Pomeroy, Iowa.
473 River Sioux, "
473 Sloan, "
463 Sioux City, "
444 Storm Lake, "
416 Webster City, Iowa.
416 Williams, "

The following changes in tariff to offices on other lines have been made:

Brady, Mich.,	25	2	Kalamazoo, Mich.
Big Rapids, Mich.,	50	3	Grand Rapids, "
Howard, "	25	2	" "
Morley, "	40	3	" "
Pierson, "	30	2	" "
Wayland, "	25	2	" "
Lanesboro, Minn.,	120	8	Milwaukee or Janesville, Wis., ck. Chicago.

In list of Pennsylvania R. R. offices in last JOURNAL, West Chester should read West Chester Intersection.

OFFICES HAVING "SPECIAL SHEET A."

Tariff to Manassas, Va., will hereafter be same as "special rate" to Gordonsville, Va.

WILLIAM ORTON, President.

◆

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
New York, May 18, 1871.

Executive Order No. 122.

Arrangements have been made for resuming the Governmental weather report service, on and after Wednesday, May 24, 1871, upon substantially the same plan as that carried out during the past Winter.

In addition to the circuits designated in the accompanying schedules for the transmission of regular weather reports, direct circuits, for the use of the signal Department, will be made up between Washington and New Orleans, Washington and Chicago, and Washington and New York, daily, at 7.45 A. M., 4.45 P. M., and 11.45 P. M., connecting with the Signal Office in Washington; and any message to or from the Signal Office will have precedence over all other business. When these circuits are not employed in the transmission of signal service messages they may be used for ordinary business. As a general rule the time required by the Signal Office for these circuits, at each report, will not be greater than that to elapse from the starting of the first weather report at any station to the receipt of the last at Washington.

Any weather report which may have failed to reach its proper destination over the regular circuit, will be sent there immediately over any other available circuit.

All weather reports reaching transfer offices within an hour of the regular time will be sent forward at once to their proper destination. Those received later than this will be held over and sent with the next regular report.

In the event of any scheduled circuit being interrupted so that it cannot be worked, weather reports will be sent over any other available route to their destination.

When weather reports are not filed at the proper time, managers of offices will report the fact briefly and at once to the Chief Signal Officer.

Observer Sergeants of the Signal Service are authorized to be present in the operating rooms at all stations during the transmission of weather reports. In case the conduct of any Observer should render his presence in the operating room objectionable to the Manager thereof, it will be the duty of the latter to promptly report the same to the Chief Signal Officer, and also to the Superintendent of the District.

Operators at transfer stations receiving reports will write them in duplicate upon manifold paper, to be furnished by the Signal Department, one copy being for the Observer and the other for file in the office.

The compensation to be paid for this service is fixed at two cents for every word transmitted upon each circuit—the address, signature, and date in all service messages being counted the same as body words of despatches.

A daily record will be made at all stations from which weather report messages are sent, showing the number of words transmitted upon each circuit for this service, and copy of the same will be forwarded to the Auditor at the end of each month.

A daily record will also be kept at the terminal stations of each circuit, showing the time occupied upon each circuit in the transmission of the three daily reports, and a copy of the same will be forwarded to the Electrician at the end of each month.

As the success of this service, as well as the comparative value to the Company of the compensation to be paid for the performance thereof, mainly depends upon the accuracy and speed with which the reports are transmitted, it is very important that competent operators should be selected for this service, and that they should be imperatively required to be promptly at their posts, prepared to receive the reports, at the time designated in the schedules.

The service being a synchronous one throughout the country, the tardiness of a single operator at any report station, involves a delay of the entire service, and hence it is of the utmost importance to its success that every man should be on hand at the time specified.

This service is not undertaken by the Company with a view solely to the profits to be derived from it, but for the purpose of assisting the Government in the prosecution of a subject of national interest, and of great scientific importance, and I desire and confidently expect to receive the cordial assistance of all officers and employees of the Company, in its successful performance.

WILLIAM ORTON, President.

◆

WANTED—The address of M. B. Brown, manager. He gave address, "South Bend, Indiana," but our answer has been returned.

◆

DURING the few weeks past a number of complaints respecting money letters sent us, which we have never received, has come to us. We desire all who have remitted to us for the statue fund, and failed to find an acknowledgment in the JOURNAL, to let us know, so that credit can be given.

The engraving will be sent, also, to those who have remitted, even if the money has been lost.

◆

SUPPLEMENT TO THE TARIFF BOOK.

The supplement to the Tariff Book is now ready for distribution, and already a number of offices have been supplied with them. Should any office not have received a copy by the 15th of June, an application to the Superintendent of the District will secure its being provided. It is very important that all offices have these books fully posted, and a more general attention paid to the entry of changes as announced in the JOURNAL than has been in many cases given. It is impossible to preserve correct checks unless all give the most conscientious attention to this department of the service.

The supplement is chiefly a compilation of the notices given in the JOURNAL since the tariff book was published.

THE MECHANISM OF MAN

Wonders by familiarity cease to excite astonishment; hence it happens that many know so little about the "house we live in"—the human body. We look upon a house from the outside just as a whole or unit, never thinking of the many rooms, the curious passages, and the ingenious internal arrangements of the house, or of the wonderful structure of the man, the harmony and adaptation of all his parts.

In the human skeleton, about the time of maturity, are 165 bones. The muscles are about 500 in number. The alimentary canal is about 32 feet long. The amount of blood in an adult averages 30 pounds, or one fifth of the entire weight.

The heart is six inches in length and four inches in diameter, and beats 76 times per minute; 4,200 times per hour; 100,800 per day; 36,772,200 per year; 2,665,440,000 in three score years and ten; and at each beat two and a half ounces of blood is thrown out of it; 175 ounces per minute; 656 pounds per hour; $7\frac{3}{4}$ tons per day. All the blood in the body passes through the heart in three minutes.

The lungs will contain about one gallon of air at the usual degree of inflation. We breathe, on an average, 1,200 times per hour; inhale 600 gallons of air, or 24,000 gallons per day. The aggregate surface of the air cells of the lungs exceeds 20,000 square inches, an area very nearly equal to the floor of a room twelve feet square.

The average weight of the brain of an adult male is three pounds and eight ounces; of a female, two pounds and four ounces. The nerves are all connected with it, directly or by the spinal marrow. These nerves, together with their branches and minute ramifications, probably exceed 10,000,000 in number, forming the "body guard," outnumbering by far the greatest army that ever was marshaled.

The skin is composed of three layers, and varies from one-fourth to one eighth of an inch in thickness. Its average area in an adult is estimated to be 2,000 square inches. The atmospheric pressure being about fourteen pounds to the square inch, a person of medium size is subject to a pressure of 40,000 pounds.

Each square inch of skin contains 3,500 sweating tubes or perspiratory pores, each of which may be likened to a little draintile one-fourth of an inch long, making an aggregate length of the entire surface of the body of 201,166 feet, or a ditch for draining the body almost forty miles long.

Man is marvellously made. Who is eager to investigate the curious, to witness the wonderful works of Omnipotent Wisdom, let him not wander the wide world round to seek them, but examine himself. "The proper study of mankind is man."

◆

Resigned.—The many friends of Mr. J. C. Dorchester, will regret to learn that he has resigned the superintendency of the Des Moines Valley R. R. Telegraph Line, and the management of the Keokuk office, to take effect May 1st. Mr. Dorchester has occupied his present position during the past two and one-half years, and in all that time we haven't heard a word of complaint against him. His relations with our business men have been of the most pleasant and agreeable character.

Mr. D. is a thorough going student, and has already won scholarly achievements. It is for the purpose of pursuing his studies in the medical profession that he has resigned. He was a member of the class of students of the College of Physicians and Surgeons, at Keokuk, last winter.

MORSE TESTIMONIAL FUND.

RECEIPTS.

"Don't leave us out."

Theo. P. Harvey, manager, Doylestown, Pa.	$1 00
James B. Young, operator, Kittrell's, N. C.	1 00
Samuel Van Dorn, Carmansville, N. Y.	1 00
Jas. L. Ed. Ragsdale, operator, Winnemucca, Nevada	50
W. Blair, Gilmore, Chambersburg, Pa.	2 00
D. B. Downer, N. York	1 00
W. E. Smith, Buffalo, N. Y.	1 00

◆

TELEGRAPHERS' MUTUAL LIFE INSURANCE.

ASSESSMENT NO. 20.

31 64 87 178 251 303 340 [illegible] [illegible] 710
796 817 916

◆

YANKTON, Feb. 23, 1871.

To the Editor of the Journal of the Telegraph:

SIR: What is the cause of, and remedy for, the following condition of things:

Station A and Station B are one hundred miles apart and at respective ends of the line.

Fifty "Hill's" cups are used at each end, and are kept up to a normal working point of 75 per cent. A opens his key, and no responsive click is heard on B's *local*, but if the relay spring is adjusted high, the motion of the relay armature can be seen. In other words, B has to adjust so high to get A that the platinum points of the armature do not close sufficiently to close the local circuit. Why is this thusly? And could it not be remedied by the introduction of a main battery at C, a middle station? This is not the case at Station A, as a main line box is used without local. No difference is effected by pushing the cones of the magnet nearer the armature. Generally the effect of doing so is to cause a "stick"—points not "dirty," either.

Yours inquiringly,

SULPHATES.

The foregoing has been on our table for some time. It refers to one of the commonest experiences on a telegraph line, and is caused by defective insulation or obstruction of some sort. The only remedy is a clear line and good insulation.

◆

CHEEKY.

To the Editor of the Journal of the Telegraph:

The following is, I think, too good to be kept private. A few months ago, the manager of one of our main offices (whom I will call A.) received, one morning, with the daily remittance of a branch office, a five dollar Canadian bank bill. The sender (whom I will call B.) made allusion to the fact that the money was worth a premium, and nothing of the kind occurred to A. at the time; but a few days later, happening to have some business at a broker's office, he produced the note, and received therefor a greenback of like denomination and a fifty cent scrip. He at once inclosed twenty-five cents in a note to B., saying that the money had brought ten per cent. premium, and begged him to accept a share of it. He thought that this little act of gratuitous kindness would certainly be acknowledged by a "thank you," at least. But, alas! for human covetousness, this expectation was not realized, but, instead, the following transpired by telegraph:

B. "I knew that Canada bill was worth a premium."
A. "Ah! is that so? How much did you allow on it?"
B. "Nothing; I took it from a Kanuck at par."
A. "Then, what I sent you is all right, isn't it?"
B. "Y-e-s, it is all right, *as far as it goes.*"

The other half was immediately sent, with a note, saying, "if you think the money should have brought more" (gold was then quoted at 113), "please say how much, and I will make up the deficiency." B. coolly pocketed the scrip, remarking to the messenger, "I guess I'll have to treat A. to a cigar on this." This generous proposition must have been reconsidered, however, as A. says the cigar has never been offered; and he thinks it strange that two per cent. more has never been demanded.

◆

Western Australia.—A company has been formed in this colony, with a guarantee of interest from the Colonial Government to carry out a system of telegraphic communication between the principal towns of the colony. The line proposed to be established embraces the remote towns of Geraldton in the north, and Albany in the south. The distance between the two towns is about 600 miles. Having regard to the past history of Western Australia, this new enterprise must be regarded as a bold one.

◆

Sir William Thompson's Patent Syphon Recorder.—Mr. White, philosophical instrument maker, Glasgow, has now on view a patent syphon recording telegraphic instrument, the invention of Sir William Thompson. On Wednesday last the instrument was connected with a wire on the London circuit, and in the presence of a number of gentlemen connected with and interested in telegraph business, a series of highly successful experiments were made. It was found that the syphon recorder instrument, which is intended chiefly to supercede the mirror instrument for submarine work, is capable of giving off messages at the rate of 120 words per minute.—*Mechanics' Magazine.*

◆

Glass is practically a non-conductor of heat as well as of electricity. A practical example of the latter may have been seen in the use of glass as an insulator, a non-conductor, for telegraphic purposes. It is difficult to draw the line of non-conduction, but bad conductors of heat are practically assumed as non-conductors. The question of conduction is purely one of degree. Let two rods of equal size and length—but one of copper and the other of glass—be brought together, and have at their extremities a small weight or marble attached by wax. Apply a spirit lamp to the ends, touching each other so that the heat be equally applied; in the case of the copper, owing to its being a good conductor, the wax will rapidly melt and let the weight drop; whilst in the case of the glass, owing to its being a very bad conductor, a very long time must elapse before such a result can happen.

◆

BORN.

April 7, 1871, to H. N. Stevens, Rocklin, Cal., a son.

To W. H. Parsons, of the W. U. Utica, N. Y., Office, April 20th, 1871, a daughter, weight nine pounds.

To N. B. Ross, of Rumney, N. H., May 10, a son.

To D. P. Gordon, manager, Castile, N. Y., May 22, a daughter.

◆

MARRIED.

Davidson—Wilder.—By the Rev. Mr. Graham, May 3d, at 8 o'clock, at the bride's father's, Mr. J. F. Davidson, manager of the Western Union Telegraph, Gainesville, Miss., to Miss Annie C. Wilder, of Amite City, La. No cards.

Jones—Marshall.—In Chicago, Ill., March 27, 1871, at the residence of the bride's father, by the Rev. G. C. Truesdell, Mr. Arthur T. Jones, agent and operator at Palatine, Ill., to Miss Alice L. Marshall, formerly of Ogdensburg, N. Y.

◆

DIED.

Blair.—At Truro, Nova Scotia, May 9th, after a short illness, of brain fever, Charles Blair, of the W. U. Tel. Office, Truro, aged 17 years. Deceased was very highly esteemed by all who knew him.

FRANKLIN, PA., May 3, 1871.

To the Editor of the Journal of the Telegraph:

DEAR SIR: My only two children died last week from scarlet fever, both boys. The first, Eugene, on Tuesday, April 25th, aged one year and twenty-nine days; the other, Leon, on Thursday, April 27th, aged three years, three months, and twenty-two days.

EBBERT JEWETT, *Manager.*

Camp.—In St. Louis, May 9, Carrie, wife of C. D. Camp, train despatcher P. W. & W. R. R.

"WORDS AND THEIR USES."

BY A MYSTIFIED QUAKER.

New York, 4th Month, 10th, '71.

RESPECTED WIFE: From these lines my whereabouts thee'll learn—
Moreover, I impart to thee my serious concern:
The language of this people is a riddle unto me,
And words, with them, are figments of a reckless mockery!

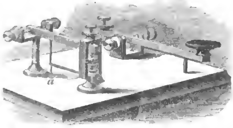
For instance: as I left the cars, an imp with smutty face,
Said "Shine!" "Nay, I'll not shine," I said, "except with inward grace!"
"Is 'inward grace' a liquid or a paste?" asked the young Turk;
"Hi Daddy! What *is* 'inward grace?' How does the old thing work?"

◆

FEMALE CLERKS IN LONDON.—The lady clerks in the Central Telegraph Office in London appear to have rather pleasant positions. As ordinary clerks the payments made to them range from 10s. to 22s. per week, according to proficiency; and as clerks in charge they receive from 25s. to 40s. They are on duty eight hours, with an interval of half an hour for dinner. There is a kitchen in the establishment, in which any provisions they may bring with them are cooked free of charge; and there is an attendant to go out and make any purchases they may desire. They commence at hours ranging from 8 in the morning until noon, so that the latest arrivals leave at 8 P.M.; and those who remain after 5 P.M. are provided with tea and bread and butter at the cost of the Department. They take the early and late hours in rotation, so that the work is fairly divided among all. The heads of the Department speak very highly of the good conduct and intelligence of the young women.

MECHANICAL TELEGRAPH INSTRUMENT,

PATENTED MAY 31st, 1870.



For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

This instrument is an outgrowth of this pressing demand. The Inventor is himself a practical operator, now in active service. Operators and others wishing to teach or learn the Art, will be delighted with this instrument.

It can be placed anywhere, as it does not occupy a space more than six inches square. A card with the Telegraph Alphabet, Numerals, &c., attached to each instrument.

Its cost is but $7, and there is no expense whatever to keep it constantly in working order.

We will send a copy of SMITH'S MANUAL, free of charge, with each instrument, to individuals or clubs.

Any person selling ten or more of the instruments, will be allowed ten per cent. commission, sent C. O. D., or on receipt of price.

Special and liberal terms to manufacturers.

To save expense of returning funds by express, remittances can be made by draft on Cleveland or Pittsburgh, or by Post Office Order, in which case no charge will be made for box. Price $7. Silver-plated, extra finish, $10.

Parties ordering Instruments, except from well-known cities, will please give name of county and State.

Address, D. W. PUTT & CO.,
Wellsville, O.

D. W. PUTT,
P. BRUNER,
W. G. BROWNSON.

JOSEPH MOORE & SON,

(Established 1830).

MANUFACTURERS OF EVERY DESCRIPTION

INSULATED WIRES

FOR TELEGRAPHIC PURPOSES.

535 & 537 CHINA ST., BELOW GREEN ST.,

PHILADELPHIA, PA.

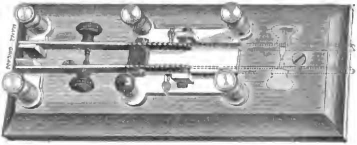
GRAY & BARTON,

479 STATE STREET, CHICAGO, ILL.,

KEEP IN STOCK THE FOLLOWING ARTICLES:

GALVANIZED WIRE,
COMPOUND WIRE,
SCREW GLASS INSULATORS,
(Cauvet's Patent).
BRACKETS, PINS, SPIKES,
BROOKS' INSULATORS,
PLIERS, VISES, PULLEYS, CLIMBERS,
WINDOW TUBES, BATTERY BRUSHES,
SYRINGES, FUNNELS, HYDROMETERS,
ACIDS AND CHEMICALS FOR BATTERIES,

KERITE WIRE,
BRAIDED AND WOUND OFFICE WIRE,
GUTTA PERCHA OFFICE WIRE,
SWITCH CORD,
CALLAUD BATTERY,
DANIELL BATTERY,
GROVE BATTERY,
BUNSEN BATTERY,
LECLANCHE BATTERY,
HILL BATTERY,



REGISTERS,
RELAYS,
BOX RELAYS.
SOUNDING RELAYS,
SOUNDERS,

KEYS,
MEDICAL INSTRUMENTS,
HOTEL ANNUNCIATORS,
PLUG CUT-OUTS,
CUT-OUTS, (new style),

REPEATERS,
SWITCHES,
GALVANOMETERS,
INDUCTION COILS
ALARM BELLS.

☞ Our Morse Instruments are of the Western Union, Ottawa (or Caton) style.

We have ample facilities for the execution of every variety of electrical work.

ATTENTION OPERATORS!

PATENTED.

We would call your attention to our

TELEGRAPH OPERATORS' BADGE PIN.

Having completed our arrangements to manufacture, by putting in new machinery, and with a full force of workmen, we are now ready to supply the GREAT DEMAND for these Badge Pins. They are made of 18k gold, and are perfect fac-simile of the present MORSE, or curved lever keys, and the new style WESTERN UNION straight lever and FANCY BASE KEYS. We are now making two different sizes, one to be three-quarters of an inch long, and the other one inch long. Also, a very small, neat, BADGE KEY PIN for LADY OPERATORS. These are the only badge pins ever got up exclusively for Operators.

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☞ The above are made with straight or curved Levers. ☜

Conductor Punch Pin	$4 00
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Persons ordering Key Pins, be particular in giving style of lever and base wanted.

Any of the above will be forwarded by express, C. O. D., or by mail, registered, by sending amount and twenty-five cents extra to pay postage and registration fee.

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Telegraphers'

Mutual Life Insurance Association.

INCORPORATED UNDER THE LAWS OF THE STATE OF NEW YORK.

I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificates and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and th payment of dues

XI. A meeting for the election of officers shall be held annually during th first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written reques of twenty-five members

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer

GERRITT SMITH, Secretary.
A. S. BROWN,
W. H. HILL,
D. R. DOWNER,
Executive Committee.

DIRECTIONS TO APPLICANTS.

1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to Gerritt Smith, Secretary Telegraphers' Mutua Life Insurance Association, 145 Broadway, New York, and a certificate of membership will be sent by return mail.'

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

5. No letters can be answered unless a stamp is enclosed for postage; and as the officers labor without compensation, correspondence requiring answers should be as limited as possible.

MR. C. F. VARLEY, in a paper read before the Royal Society, notes the enormous electrostatic capacity of platinum plates immersed in acidulated solutions. With electric potentials of less amount than sufficient to decompose water, they can be charged and discharged like condensers. Mercury and mercurial amalgams he likewise found could be polarized with hydrogen. A vessel fixed on a board has within it two funnels, connected by tubes with two others outside. The four are so arranged that when each is about one-third full of mercury, by tilting the board, the mercury, in regaining its equilibrium, diminishes its surface in one of the funnels inside the vessel, increasing it in the other. The vessel is then filled with acidulated water, and if the mercury be pure, no current takes place on altering the relative surfaces; but if one surface be polarized with hydrogen, and the battery removed, on again augmenting the one surface and diminishing the other, an electric current is set up. He could not succeed in polarizing mercury with oxygen. By careful measurement he ascertained that with platinum plates the charge increases directly as the potential, up to 0.08 of a Daniell's cell, but beyond that he found that the charge increased in a much greater ratio. He believes the variation is as the square root of the potential. A useful inference from these experiments is the impracticability of working uninsulated telegraphic wires in the ocean. The French Atlantic cable from Brest to St. Pierre works about 10 words per minute. Mr. Varley calculates that an uninsulated solid conductor of the same weight per mile must be only 1,100 yards in length to compete in speed of signalling with 2,500 miles of the same conductor insulated.

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that he will guarantee to make and deliver at his Factory any style of Cable, Insulated with Gutta Percha, as low as they can IMPORT *Cable of the same style and quality.*

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JOURNAL OF THE TELEGRAPH.

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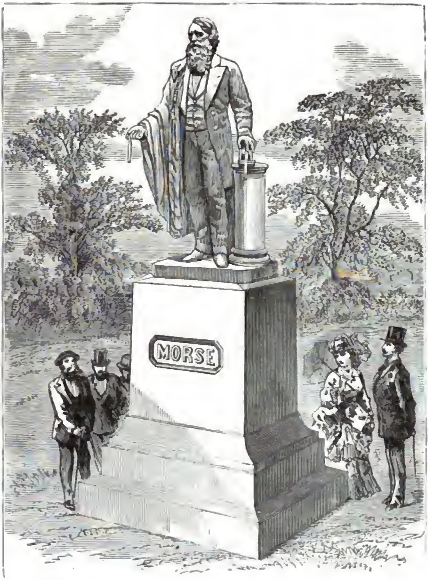
INAUGURATION OF THE

STATUE OF PROFESSOR MORSE,

Central Park, New York, June 10, 1871.

As soon as it became thoroughly certain that the statue of Professor Morse would be ready for inauguration June 10th, and the programme announced in the JOURNAL of June 1 had been received, a most marked enthusiasm took possession of the public mind. Day by day our office was crowded by impatient applicants for tickets of admission to the coming ceremonies. The mails also brought immense numbers of letters, ordering seats and offering congratulations. A week before the day fixed for the inaugural ceremonies, more applications for seats at the great evening reception to Professor Morse were received than the Academy of Music could hold. It became, therefore, a matter of great anxiety how to accommodate the multitude who were coming from distant places, and how to repel the applicants at home. We did our best, but a large number of the oldest and most distinguished families of New York had to be denied admittance, and we fear others may have been disappointed.

Now came the delegates. As early as June 7th, familiar faces from distant cities began to show themselves, and many an old familiar name was again named, as we grasped hands that once toiled with us in our early labors. By Saturday morning, June 10th, there were recorded delegates from Pennsylvania, Mississippi, District of Columbia, Maryland, Connecticut, Canada, Louisiana, Massachussetts, Georgia, Ohio, Tennessee, Illinois, New Jersey, Iowa, North Carolina, Michigan, Kentucky, California, Nebraska, Indiana, Vermont, Maine, Rhode Island, W. Virginia, Virginia, Nova Scotia, and Minnesota. A large number failed to record their names, and there were many hands we failed to grasp. We speak the simple truth, which is yet upon every lip, that never has there assembled in any city, for any purpose, a finer looking or more intelligent class of men. In this we glory. As we gazed on the vast assemblage convened on the evening of the eventful day in the Academy of Music, we felt that the telegraph interests of America were in the hands of true and noble men.



THE HARBOR EXCURSION.

The celebration of the day began by an excursion down the bay and through the East and North rivers, given by the firm of L. G. Tillotson & Co. to the telegraphic fraternity and their friends. The magnificent steamer James Fisk, Jr. was chartered for the occasion, and not less than one thousand invited guests were on board. The excursionists, at a few minutes past 10 o'clock, left the pier at the foot of Chambers street, the Fifty-fifth Regiment Band accompanying them and adding to the pleasure of the occasion by their excellent music. Down the Hudson, out into the harbor, round Governor's Island, up the East River and back to the starting point, was the route followed by the party. All along their way were countless tokens of the sympathy of all classes. The vessels of every nation represented in our port were decorated with flags; steam-whistles and cheers gave loud expression of the unanimous feeling of happiness and mutual interest in the occasion shared not only by all here, but by the world. There were abundant supplies of refreshments provided by the generous firm who acted as hosts and entertainers, and ample justice was done to their hospitality. An impromptu meeting was organized, at which resolutions were offered tendering the hearty thanks of the excursionists to Messrs. Tillotson & Co., for their characteristically generous and liberal action. Acknowledging the compliment, Mr. Tillotson made a very neat and effective little speech, giving their meed of credit to that large class of keen and intelligent men, the telegraph operators, and proposing three cheers for Professor Morse, which were heartily given by all on board.

The Hon. Erastus Brooks also addressed the meeting. He spoke of the vast good which had been done to our country by the electric telegraph, and its marvellous advantages to trade and commerce, journalism and the family. In speaking of Mr. Morse, Mr. Brooks associated his name with Franklin, who, like Prometheus, drew the fire from heaven, and of Robert Fulton, who had made steam navigation practical. Morse was one of the great benefactors of his race and country. He deserved not only our respect, but admiration.

Vocal and instrumental music followed, and Mr. Charles Mackintosh was brought forward to address the assemblage. He said he had been a telegraph operator himself, and he felt a fraternal interest in the craft. For many years he had worked the instrument, and although he had now given up the active pursuit of the profession he always kept a kindly place in his heart for old memories. There were more men in the United States holding high positions to-day who had risen from the grade of telegraph operator than there were from any other profession in the country. The work requires a man of intelligence, clear-headedness and constant watchfulness, well educated and sober, and it was not astonishing that such men frequently soared above the common level.

The following resolutions were offered by James W. Stover on the steamer, and were adopted by the telegraphic excursionists by acclamation.

Resolved, That our thanks are tendered to Messrs. L. G Tillotson & Co., for the complimentary excursion given to the telegraphic profession upon the occasion of the inauguration of the statue of Professor S. F. B. Morse, in their characteristic, generous and liberal manner.

Resolved, That we recognize in this the evidence of Mr. Tillotson's loyalty to the profession of which he was for so many years an able and honorable member, and congratulate him, as well as ourselves, that in this, as in other matters, the name of Tillotson and success are synonymous.

Resolved, That we also return our thanks to the attaches of Tillotson & Co.'s establishment for their unremitting exertions to make this a satisfactory and creditable affair to all parties.

A letter was read from Professor Morse, regretting his inability to participate in the excursion.

Speeches were also made by Mr. Ashley, editor of the *Telegrapher*, Mr. J. W. Stover, and Rev. M. H. Smith. Among those on board were Governor Claflin, of Massachusetts ; Rev. Dr. Ormiston, James Dakers, Secretary of the Montreal Telegraph Co. ; H. Sibley, of Rochester ; C. G. de Moll, of Philadelphia ; and a number of other distinguished gentlemen. We regret that the pressure upon us by crowds of anxious men desiring admittance to the evening reception denied us the pleasure of the excursion, for which Mr. Tillotson deserves and will receive the highest praise. The weather was most delightful, and all the excursionists were delighted.

UNVEILING THE STATUE AT CENTRAL PARK.

The glorious weather, with its genial warmth and cooling breeze, attracted many thousands to Central Park. At least ten thousand persons gathered around the stands erected by the pedestal of the statue, to see the bronze presentment of the great inventor unveiled. It had been brought in the morning from the foundry, at half-past seven o'clock, and placed upon its pedestal. It stood in the angle between the two platforms for the invited guests, and was wrapped in the folds of the Stars and Stripes. As before intimated, it is erected on an eminence, a little south of the Casino and near the Drive. It faces toward Fifth avenue, and stands a little in advance of a huge elm, which furnishes an agreeable background. The band from Governor's Island was in attendance and played a selection of national airs. Upon the platform to the left of the statue were about fifty ladies, including Mrs. Professor Morse, Miss Morse, Mrs. Roosevelt, Miss Goodrich, Mrs. A. T. Stewart, and Mrs. McCormick. On the one to the right were gathered a number of prominent gentlemen, among whom may be mentioned Governor Hoffman and staff, General McQuade, General Johnson, and Colonel Ward ; Governor Claflin, of Massachusetts and staff ; his Honor Mayor Hall, William Orton, O. H. Palmer, R. B. Hoover, Judge Charles P. Daly, Peter Cooper, B. H. Pickett, Marshall O. Roberts, Commissioner Agnew, Wilson G. Hunt, Cyrus W. Field, General T. T. Eckert, Henry Hilton, Esq., Dr. C. C. Cox, Cambridge Livingston, Dr. G. B. Loring, E. S. Sanford, Hiram Sibley, J. H. Wade, Dr. Samson, William Cullen Bryant, C. H. McCormick, General J. G. Wilson, and Rev. Stephen H. Tyng.

Shortly after four o'clock, amid cheers from the multitude assembled, Governor Hoffman arose and made the following remarks, in a full, clear voice :

GOVERNOR HOFFMAN'S SPEECH.

Ladies and Gentlemen :—We are met to witness the completion of a statue erected in honor of an American citizen who is still living. It is a noble monument of the veneration and affection of the Telegraphic staff of the Continent. In the most conspicuous and the most beautiful of the public grounds of the chief city of this Western hemisphere this statue of Samuel F. B. Morse shall stand for ages. The enduring material of which it is made may, in the long lapse of time, crumble ; yet his name will not be lost to the memory of man. By his own works he has secured for it immortality. So long as language lasts it will be spoken and honored.

The faculty of speaking is the gift whereby God has favored man above his other creatures. By it we are enabled to utter to our neighbor our wants, our sufferings, our sympathies, every idea and feeling which arises within us. Anxious to pay to his memory its highest honors, the world has sought, during all history, to discover the name of the inventor of the alphabet. By means of it we were empowered to speak to the eye as well as to the ear, and to transport to the most remote parts of the earth the utterances of mind and heart, in visible and lasting form. Hours, days, weeks, months may elapse before that which we would have spoken to our absent friends, if at our side, can reach its destination ; but, thanks to the alphabet, it reaches them at last, fresh and in perfect keeping. The Creator blessed man by giving him the power of language ; and through the alphabet how greatly has the blessing been expanded! By it the dead of ages past speak to us to-day, in their written utterances ; and by it we speak to generations yet unborn. Centuries and centuries passed away, and this great expansion of the means of intelligent communication was all the improvement to which human invention was equal.

In our day a new era has dawned. Again, for the second time in the history of the world, the power of language is increased by human agency. Thanks to Samuel F. B. Morse, men speak to one another now, though separated by the width of the earth, with the lightning's speed and as if standing face to face. (Applause.) If the inventor of the alphabet be deserving of the highest honors, so is he whose great achievement marks this epoch in the history of language—the inventor of the electric telegraph. We intend that, so far as in us lies, the men who come after us shall be at no loss to discover his name for want of recorded testimony.

In doing Professor Morse, during his life, the extraordinary honor which we are met this day to make complete, we contribute little to his well-earned glory ; nevertheless, the people of this great city, represented by their Mayor, and the people of two States—the State of his birth, and the State of his adoption—uniting in this ceremonial in the persons of their chosen chief magistrates, find great gratification for themselves in this opportunity to testify their appreciation of the honor and the benefits which he has conferred on them and on the country. (Applause.) The Governor of Massachusetts, the native State of Morse, will now unveil the statue, and then William Cullen Bryant will speak to you as he only can speak. How fitting that he who—having before him the letters of the ancient alphabet which Cadmus brought into Greece, has by his great translation, enabled all English-speaking men to realize to-day, in their own tongue, the power and genius of Homer—should be our leader on this occasion in paying a just tribute to one who is his friend, and who, like himself, has, from the pursuits of private life, cast real and enduring lustre upon the American name! [Applause.]

THE UNVEILING.

After Gov. Hoffman had closed his address, Gov. Claflin and the Hon. Wm. Orton threw aside the drapery, and displayed the statue to the vast assemblage. A tumultuous outburst of applause followed, the band playing the "Star Spangled Banner."

THE STATUE

is of heroic size, and was modeled by Byron M. Pickett, and cast at the National Fine Art Foundry of New York, by Maurice I. Power, on both of whom it reflects great credit. The face is a striking likeness of Professor Morse, who is represented holding the first message sent over the wires, and devoutly recognizing the truth of its language, "What hath God wrought! The beard is made quite full, and the stiffness of modern dress is relieved by a cloak with a heavy fur collar. This cloak, falling from the left side, is held up by the right hand, which also holds the telegraphic despatch. The left hand rests upon a telegraphic instrument upon a column. The attitude is easy and natural, and the entire work is in the highest degree creditable to the artist.

When the applause which followed the unveiling had subsided, William Cullen Bryant, Esq., the venerable poet of America, and life-long friend of Professor Morse, was introduced, and spoke as follows :

ADDRESS OF MR. BRYANT.

There are two lines in the poem of Dr. Johnson on the Vanity of Human Wishes which have passed into a proverb :

> "See nations, slowly wise and meanly just,
> To buried merit raise the tardy bust."

It is our good fortune to escape the censure implied in these lines. We come together on the occasion of raising a statue, not to buried but to living merit—to a great discoverer who yet sits among us, a witness of honors which are but the first fruits of that ample harvest which his memory will gather in the long train of seasons yet to come. Yet we cannot congratulate ourselves on having set an example of alacrity in this manifestation of the public gratitude. If our illustrious friend, to whom we now gladly pay these honors, had not lived beyond the common age of man we should have sorrowfully laid them on his grave.

In what I am about to say I shall not attempt to relate the history of the electric telegraph, or discuss the claims of our friend to be acknowledged as its inventor. I took up the other day one of the forty-six volumes of the great biographical dictionary compiled by French authors, and immediately after the name of Samuel Finley Breeze Morse, I read the words 'inventor of the electric telegraph.' I am satisfied with this ascription. It is made by a nation which, having no claims of its own to the invention, is naturally impartial. The words I have given may be taken as an expression of the deliberate judgment of the world, and I should regard it as a waste of your time and mine to occupy the few minutes allotted to me in demonstrating its truth. As to the history of this invention, it is that of most great discoveries. Coldly and doubtingly received at first, its author compelled to struggle with difficulties, to encounter neglect, to contend with rivals, it has gradually gained the public favor till at length it is adopted by the civilized world.

It now lacks but a few years of half a century since I became acquainted with the man whom this invention has made so famous in all countries. He was then an artist, devoted to a profession in which he might have attained a high rank, had he not, fortunately for his country and the world, left it for a pursuit in which he has risen to a more peculiar eminence. Even then, in the art of painting, his tendency to mechanical invention was conspicuous. His mind, as I remember, was strongly impelled to analyze the processes of his art—to give them a certain scientific precision, to reduce them to fixed rules, to refer effects to clearly defined causes, so as to put it in the power of the artist to produce them at pleasure and with certainty, instead of blindly groping for them, and, in the end, owing them to some happy accident, or some instinctive effort, of which he could give no account. The mind of Morse was an organizing mind. He showed this in a remarkable manner, when he brought together the artists of New York, then a little band of mostly young men, whose profession was far from being honored as it now is, reconciled the disagreements which he found existing among them, and founded an association, to be managed solely by themselves—the Academy of the Arts of Design—which has since grown to such noble dimensions, and which has given to the artists a consideration in the community far higher than was before conceded to them.

This ingenuity in organization, this power of combining the causes which produce given effects into a system, and making them act together to a common end, was not long afterwards to be exemplified in a very remarkable manner. The voyage made by Mr. Morse, from Havre to New York, on board the packet-ship Sully, in the year 1832, marks an important era in the history of inventions. In a casual conversation with some of the passengers concerning certain experiments which showed the identity of magnetism and electricity, the idea struck his mind that in a gentle and steady current of the electric fluid there was a source of regular, continued and rapid motions, which might be applied to a machine for conveying messages from place to place, and inscribing them on a tablet at their place of destination. We can fancy the inventor, full of this thought, as he paced the deck of the Sully, or lay in his berth, revolving in his mind the mechanical contrivances by which this was to be effected, until the whole process had taken a definite shape in his imagination, and he saw before him all the countries of the civilized world intersected with lines of his electric wire, bearing messages to and fro with the speed of light.

I have already said that this invention met with a tardy welcome. It was not till three years after this, that is to say, in 1835, that Morse found means to demonstrate to the public its practicability by a telegraph constructed on an economical scale, and set up at the New York University, which recorded messages at their place of destination. The public, however, still seemed indifferent; there was none of the loud applause, none of that enthusiastic reception, which it now seems natural should attend the birth of so brilliant a discovery. I confess that I was not without my share in the general misgiving, and although the processes employed were exceedingly curious and highly creditable to the inventor, I had my fears that the new telegraph might prove little more than a most ingenious scientific pastime, easily getting out of order in consequence of the delicacy of its construction, not capable of being used to advantage for great distances, and for short ones only suitable for messages in their most abbreviated form.

The inventor, however, saw further than we all, and I think never lost courage. Yet I remember that some three or four years after this he said to me with some despondency, 'Wheatstone in England and Steinheil in Bavaria, who have their electric telegraphs, are afforded the means of bringing forward their methods, while to my invention, of earlier date than theirs, my country seems to show no favor.' He persevered, however, and the doubts of those who hesitated were finally dispelled in 1844 by the establishment of a telegraph on his plan between Washington and Baltimore. France and other countries on the European continent soon adopted his invention and vied with each other in rewarding him with honors; the indifference of his countrymen, which he could not but acutely feel, gave place to pride in his growing fame, and to-day we express our admiration for his genius and our gratitude for the benefit he has conferred upon the world by erecting his statue.

It may be said, I know, that the civilized world is already full of memorials which speak the merit of our friend and the grandeur and utility of his invention. Every telegraphic station is such a memorial; every message sent from one of these stations to another may be counted among the honors paid to his name. Every telegraphic wire strung from post to post, as it hums in the wind, murmurs his eulogy. Every sheaf of wires laid down in the deep sea, occupying the bottom of soundless abysses, to which human sight has never penetrated, and carrying the electric pulse, charged with the burden of human thought, from continent to continent, from the old world to the new, is a testimonial to his greatness. Nor are these wanting in the solitudes of the land. Telegraphic lines crossing the breadth of our continent, climbing hills, descending into valleys, threading mountain passes, silently proclaim the great discovery and its author to the uninhabited desert. Even now there are plans for putting a girdle of telegraphic stations around the globe, which, in all probability, will never be disused, and will convey a knowledge of his claims on the gratitude of mankind to millions who will never see the statue erected to-day. Thus the Latin inscription in the church of St. Paul's, in London, referring to Sir Christopher Wren, its architect: 'If you would behold his monument look around you,' may be applied in a far more comprehensive sense to our friend, since the great globe itself has become his monument. (Cheers.)

All this may be said and all this would be undeniably true, but our natural instincts are not thus satisfied. It is not the name of a benefactor merely, it is the person that we cherish, and we require, whenever it is possible, the visible presentment of his face and form to aid us in keeping the idea of his worth before our minds. Who would willingly dispense with the image of Washington as we have it in painting and sculpture, and consent that it should be removed from the walls of our dwellings and from all public places, and that the calm countenance and majestic presence with which we associate so many virtues should disappear and be utterly and forever forgotten? Who will deny that by means of these resemblances of his person we are the more frequently reminded of the reverence we owe to his memory?

"So in the present instance, we are not willing that our idea of Morse should be reduced to a mere abstraction. We are so constituted that we insist upon seeing the form of that brow beneath which an active, restless, creative brain devised the mechanism that was to subdue the most wayward of the elements to the service of man and make it his obedient messenger. We require to see the eye that glittered with a thousand lofty hopes, when the great discovery was made, and the lips that curled with a smile of triumph when it became certain that the lightning of the clouds would become tractable to the most delicate touch. We demand to see the hand which first strung the wire by whose means the slender currents of the electric fluid were taught the alphabet of every living language—the hand which pointed them to the spot where they were to inscribe and leave their messages. All this we have in the statue which has this day been unveiled to the eager gaze of the public, and in which the artist has so skillfully and faithfully fulfilled his task as to satisfy those who are the hardest to please, the most intimate friends of the original. On behalf of the telegraphic workers of the Continent, who have so nobly and affectionately provided it, I do now present it to the authorities of the City of New York for perpetual and loving care. (Cheers.)

"But long may it be, my friends—very long—before any such resemblance of our illustrious friend shall be needed by those who have the advantage of his acquaintance, to refresh the image of his form and bearing as it exists in their minds. Long may we keep with us what is better than the statue—the noble original. Long may it remain among us in a healthful and serene old age. Late, very late, may He who gave the mind to which we owe the grand discovery to-day commemorated, recall it to his more immediate presence that it may be employed in a higher sphere and in a still more beneficial activity.

After the applause which followed Mr. Bryant's address, which was delivered with much earnestness and pathos, had subsided, his honor, Mayor Hall, was received with hearty cheers, and spoke as follows:

REPLY OF MAYOR HALL.

Although Morse lives, New York enshrines him. She commemorates him as the scientific associate of her departed Fulton, whose statue must before long from yonder observatory height overlook the rivers first conquered by steam.

One middle state city loves to remember how her citizen Franklin modestly passed the portals of the temple of electrical science; a southern city how her citizen Whitney developed a cotton empire; a western city how her citizen McCormick presented to agriculture its greatest boon; and adjacent eastern cities gratefully recall how their citizens Morton and Jackson blessed humanity, and how Elias Howe lightened the toil of the poor. The genius of these Americans changed the atmosphere of social life, which now is not in any aspect the same as it was to the elder generation of this Union. Their genius blessed food, raiment and locomotion. But New York cherishes more proudly and gratefully the thought that the genius of her citizen Morse put all those inventions into world-wide service, and is fast bringing together all the peoples who were dispersed at the Tower of Babel. (Applause.)

The city of New York pledges herself to the donors who make her their trustee, to guard with pride this statue of her honored citizen; of him who achieved indeed eminence among her artists, and won respect and love in her social life before he was awarded those special honors which the civilized world now render him, and which this day's ceremonies so appropriately emphasize. (Applause.)

Governor Hoffman announced that Mr. Cyrus W. Field would read despatches he had received:

WILSON G. HUNT, Esq.:

Please present my sincere regrets to Professor Morse and to your Committee that I am unable to be present to-day, having just reached home from the South. I should be delighted to contribute in any way to the honor of so great and good an American.

GEORGE F. RANDOLPH, Governor of New Jersey.

I have another despatch from a neighboring village, London, dated June 10, two minutes past eight P. M. (Laughter.) It was received here at five minutes to four:

C. W. FIELD, Central Park:

In the name of the Anglo-American Company I feel proud to join in doing honor to Professor Morse, who has so largely contributed to the development of telegraphing, and facilitating instantaneous communication between different nations of the world.

HAMILTON, Chairmen.

Mr. Field also read the following letter:

LONG BRANCH, N. J., June 6, 1871.

JAMES D. REID, Esq.,

Chairman Morse Telegraph Committee:

Dear Sir: I am just in receipt of your invitation on behalf of 10,000 telegraphic laborers to be present on Saturday next at the inauguration of the statue in honor of Professor Morse.

Plans made previous to the receipt of your invitation will prevent my acceptance, but do not prevent my appreciation of the services rendered to science and the wants of commerce, trade and travel, by the distinguished man in whose honor you meet.

Your obedient servant,

U. S. GRANT.

The exercises closed by an invocatory prayer, by Rev. Stephen H. Tyng, D. D., rector of St. George's, New York, which we regret not being able to report, and with the singing of the doxology by the assemblage, to the accompaniment of the band. As the sound of 10,000 voices went up into the pure summer air, to the accompanyment of the rustle of the leaves of the overshadowing trees, the scene was grand, and impressive, and memorable. Between the parts of the exercises the fine band of Fort Columbus gave appropriate music.

The New York *Herald* of June 11, says:

"The most important event of the century found a fitting voice June 10th in the N. Y Central Park. There was no booming of cannon, no torchlight demonstration, no gathering of the criminal class for deceptive show; but there was the undemonstrative outpouring of those citizens who are always, in all lands, their country's pride—namely, the intelligent and the moral section of the population. In every important particular the unveiling of the statue of the living Professor Morse yesterday was as consistent with the well-studied proprieties of the event as have been any of the demonstrations within the recorded past. In the very nature of the occasion there was nothing to excite the unintellectually vulgar. The celebration of the discovery and perfection of telegraphy was not an occasion on which the mass of those who have become accustomed to derive their excitements from the records, punishment, or glorification of crime, were inclined to devote a day to its appropriate recognition. More so yesterday than, perhaps, on any previous day for many years, mental New York, whether found in the chamber of the scientist or on the bench of the cobbler's stall, went out to a duty it owed to itself—to unveil the statue of Morse.

During all the time devoted to fitting orations there was not a single occasion upon which the speaker could be charged with having violated the higher atmosphere of the august occasion. From the noonday tribute attending the unveiling of the statue in Central Park to the conclusion of the later evening demonstrations, there was nothing which could warrant the declaration that the occasion had been used for ulterior effect. The addresses from Governor Hoffman, William Cullen Bryant, Mayor Hall, and the others, were purely pertinent to the great occasion, and were, therefore, well received. At no time have the deservedly prominent men of the city and country found themselves in attendance upon a public occasion when they could more fittingly have said, "I am here as a duty; the dignity of the occasion finds its assertion, not in my presence, but in the event which caused it to be." And all that still but speaking nature, touched by art, could add to the appropriateness of the demonstration was but the clean cut sward, the rich, green spruce, the oak and exotics now flourishing there; an evidence that Nature's hand was upraised in the work, and that springtime bloomed and was glad. These were the conditions, these the associations, these the surroundings which marked the event.

THE GRAND RECEPTION AT THE ACADEMY OF MUSIC.

The grand demonstration which attended the unveiling and dedication of the Morse statue in the Central Park in the afternoon had a most fitting accompaniment and glorious consummation at the Academy of Music in the evening. The preparations for the closing ceremonies of the day were on a scale which, as announced, must have kept the thousands who assembled on Saturday evening at the Academy in reserve for the occasion, withholding them from attending the statue ceremonies proper. In view of the fact, known a week ago, that tickets for every seat in the spacious building had been disposed of, it is needless to say that the audience was perhaps the largest, and, in view of the object which brought them together, might be fairly classed as the most intellectual that had ever assembled within the walls of the Academy. The day's work so auspiciously commenced, was, indeed, brought to successful fruition on that evening, and all who participated in or witnessed these closing proceedings must have retired with the conviction that it was well for them to be there—in raising a monument to the real Puck, who, in less than even the fabled forty minutes, has put a "girdle round about the earth," bringing into communication with each other in less than that time the most distant peoples and nations of the globe.

The Committee of Arrangements managed all the duties devolving upon them in a most admirable manner—the Academy, from the opening of the doors, filling up to repletion, without the slightest perceptible noise or interruption.

THE PLATFORM

was, of course, occupied by some of our most prominent citizens, with worthy representatives from other States, men best known in the walks of trade, business and commerce, whose interests are firmly linked not only with the peace and prosperity of our own land, but which hinge in a vital manner upon international comity all over the world. Recognising in the invention and application of the telegraph the world's great mediator and pacificator, no wonder they assembled to do honor to the distinguished American whose genius has done so much towards and bids fair to realize the Divine promise, "Peace on earth and good will to man." Until that happy time arrives, when the sword will not be politically only, but in reality, turned into the reaping hook, it will ever be pleasant to behold the men of war aiding in the great work which is to make peace permanent and war impossible. Among many gallant generals and officers who were on the platform was to be seen occupying a front seat, as he had often been seen in the battle's front, General Banks, of Massachusetts. Near him sat General Jefferson C. Davis, the gallant commander of the old Fourteenth Army corps. There too sat the foremost intellect of the age, Henry Ward Beecher, Horace Greeley, and many others known to fame.

THE RECEPTION

given to the venerable man in whose honor the day's demonstrations were held was as enthusiastic as well could be. Cheers from the gentlemen and waving of white handkerchiefs by the ladies greeted him as he entered, and these were kept up for a considerable time. Professor Morse gracefully acknowledged the salutation and seemed much affected by it. In the front of the platform was the speaker's stand, on either side of which was a magnificent vase of flowers. In the centre also stood a small table, bearing the first telegraphic register ever employed on actual service on the continent, and which was kindly loaned by Mrs. Alfred Vail, of Morristown, N. Y., whose property it is.

President—Hon. WILLIAM ORTON.

Vice-Presidents:

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Hon. E. D. Morgan,
Hon. W. E. Dodge,
Hon. William Kelly,
Hon. Ezra Cornell,
Hon. W. H. Kent,
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Gov. Claflin, of Mass.,
Gov. Perham, of Maine,
Gov. Cooke, of Washington, D.C.,
Gov. Stearns, of N. H.,
Gov. John W. Stewart, of Vt.,
Gov. Padelford, of R. I.,
Gov. Bowie, of Md.,
Gov. Geary, of Penn.,
Gov. Ponder, of Del.,
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A. B. Mullett, Esq.
Bishop Simpson,
Prof. John W. Draper,

At exactly a quarter to eight, punctual to the programme, Hon. William Orton took the chair, and called on Rev. Howard Crosby, Chancellor of the New York University, to utter the opening invocation.

THE INVOCATION.

Almighty and most merciful God, who of old didst lay the foundations of the earth, and didst form and furnish it to be the habitation of man, we rejoice before Thee in all the manifestations of Thy love to us in creation, providence and redemption, and render unto Thee the thankful praises of our hearts. From Thee come not only the bounties of nature, but also the inventive faculties of the mind, which mold and fashion these bounties for the thrift, comfort and advantage of man, and so to Thee most rightfully belongeth our gratitude for every addition to human welfare in society and civilization.

Assembled this evening to greet one whom Thou hast raised up to be a contributor to the well-being of our race, we adore Thee that Thou hast bestowed these gifts through thy servant, and pray Thee to make his heart glad with the sight of truth, righteousness, peace, and prosperity—spreading every where by the line that is gone out through all the earth, and the words that fly to the end of the world. Long spare him to his family, his country and mankind, and grant that, after he hath fulfilled an earthly life of continued usefulness and honor, he may at last enter upon the enjoyment of the Heavenly life in the presence of his God and Saviour. And now mercifully direct, we beseech Thee, all the words and actions of this evening, that all things may be begun, continued and ended in Thee. And to Thy name, Father, Son, and Holy Spirit, shall be all the praise forever. Amen.

Mr. Orton thereupon arose, and after a welcoming cheer, spoke as follows:

ADDRESS OF HON. WILLIAM ORTON.

Twenty-eight years ago a citizen of New York succeeded in obtaining an appropriation from Congress, to enable him to test the utility of an invention which was considered of such slight importance and its prospects of success were deemed so doubtful, that private enterprise was unwilling to risk the small sum needed to give it a trial. The inventor was an artist, and, of course, he was poor. Congressmen could afford, as they did, to slight him with impunity, for he was considered but one of that numerous class of philanthrophists who were seeking then, as now, for opportunities to serve the public at the public's expense.

During the debate on the appropriation, the inventor and his invention were spoken of in terms of derision, and an amendment was deliberately offered and actually entertained by the Chairman, who refused, on appeal, to rule it out of order, directing the use of one-half the sum for trying experiments *in Mesmerism*, under the direction of the Secretary of the Treasury; and it was also suggested that *Millerism* was entitled to share in the appropriation.

But, finally, after four weary years of patient waiting and persistent entreaty, the perseverance and importunity of the artist were at last rewarded by an appropriation of thirty thousand dollars.

The petitioner for that appropriation is the honored guest of this occasion; (cheers); and the purpose for which he sought it was to test the practicability of the Electric Telegraph.

But the acorn is not an oak, nor is a handful of seed the certain evidence of an abundant harvest. The appropriation was expended on a line from Baltimore to Washington, which was completed in 1844, and, after trial, it was abandoned by the Government, with an official announcement that its receipts could not be made to equal its expenses.

Such a declaration, from such a source, could not fail to result in discouragement to the inventor, as well as to those who were beginning to consider the propriety of investing capital in a larger experiment. Companies were formed, however, which succeeded in extending the lines to Philadelphia, New York, Boston, Buffalo, and other cities, so that by 1850 the utility of the telegraph had been successfully demonstrated, although it was several years later before its success, financially, was established. The telegraph, as a successful enterprise, is, therefore, the growth of the last twenty years. What other product of human ingenuity has ever reached such proportion and developed such results in so short a time! (Applause.)

Almost the entire world is now embraced within its network of lines.

Europe possesses 450,000 miles of wire and 13,000 stations; America, 180,000 miles of wire and 6,000 stations; India, 14,000 miles of wire and 200 stations; and Australia, 10,000 miles of wire and 270 stations; and the extension throughout the world is at the rate of 100,000 miles of wire per annum. There are, in addition, 30,000 miles of submarine telegraph wire now in successful operation, extending beneath the Atlantic and German Oceans; the Baltic, North, Mediterranean, Red, Arabian, and China Seas; the Persian Gulf, the Bay of Biscay, the Strait of Gibraltar, and the Gulfs of Mexico and St. Lawrence.

More than twenty thousand cities and villages are now linked in one continuous chain of telegraphic stations. The mysterious wire, with its subtle influence, traverses all civilized lands, and passes beneath oceans, seas and rivers, bearing messages of business and friendship, and constantly, silently but powerfully contributing to the peace, happiness and prosperity of all mankind.

In but few instances have statues been erected to living men in token of the gratitude of their fellows for benefits conferred, enjoyed and appreciated. Indeed, gratitude is rarely a settled conviction pervading the public mind, and persisting in conferring honor where honor is really due. It is sometimes merely an infectious sentiment which breaks out in public demonstrations towards the favorite of an hour, who is praised to-day, and blamed or forgotton to-morrow. Popular fancy is notoriously capricious. Frenchmen erected and then demolished the statue of Louis XIV. On its site was reared the column of Austerlitz to commemorate the achievements of the first Napoleon, and to perpetuate the glory of France. Within a few weeks the latter has been torn from its base in obedience to popular clamor, and the fragments of its beautiful bronzes have littered the *Place Vendome.* But Frenchmen are not exclusively capricious—nor Parisians the only Image Breakers. A century ago loyal New Yorkers erected a statue of George the III. Six years later, indignant patriots tore down the leaden effigy, converted it into bullets and fired them at the soldiers of their King.

These historic incidents are not cited for the purpose of raising doubts concerning the permanency of the work, whose completion we have witnessed today. The statue of Kings George and Louis, and the column of Vendome were demolished because, in the judgment of those who did it, they typified a Wrong! The glories they illustrated had been achieved through oppression and suffering, and the devastation and ruin which mark the track of war. Our work, on the other hand—although in honor of a man—commemorates an achievement which, in the infancy of its results, has already conferred inestimable benefits upon the people of more than half the globe, without having occasioned a pang of sorrow to a single human being (Cheers.) If be is entitled to be esteemed a benefactor who makes two blades of grass to grow where but one grew before—with what honors shall we crown him through whom wars have been postponed and shortened—peace promoted and extended—time annihilated and distance abolished—and all the highest and noblest faculties of man multiplied, extended and enlarged. (Applause.) Wonderful art! Most fortunate of artists! The loveliest tints that glow beneath the pencil will fade away; the granite and bronze this day reared will yield their particles one by one till not a trace remains; but the fame of our artist, and the wonder of his art will go down the ages with civilization and christianity, till "the earth shall be filled with the knowledge of the Glory of the Lord, as the waters cover the sea." (Applause.)

Mr. Orton then introduced Dr. Geo. B. Loring, of Salem, Mass., to the audience.

DR. LORING'S ADDRESS.

THEME—THE TELEGRAPH AND INTERNATIONAL INTERCOURSE.

In attempting to discharge the duty which your committee has assigned me this evening, I am oppressed and weighed down by the magnitude of the occasion, and of the subject set apart for my consideration. This is not an hour for discussion, but for congratulation rather, for joy, for gratitude to God that he has endowed one of his children with faculties capable of unfolding the mysteries of His creation, and of calling upon the great hidden forces of nature to do man's bidding, in the high and holy work of advancing that intellectual and moral and material condition, which, when secured, will realize the sublime design, fixed when He created of one blood all men to dwell on the face of the earth There is neither wisdom, nor knowledge, nor eloquence equal to the simple fact before us—to that achievement of our own day, which sends the thought and sentiment of this assembly throbbing in an instant throughout the civilized world, and calls around the distinguished inventor a grateful multitude, of every kindred, and name, and tongue under heaven—a congregation which no man can number. The most appropriate topic to-night is the invention—the invention still—and how it came to pass; the most delightful spectacle is the venerable form of Morse himself, calling not on us alone, but admiring millions about him; the most eloquent word is the click of that little instrument, whose voice goes hence to Cathay and farthest Ind, and proclaims to all who have ears to hear every new-born joy and sorrow, and victory and defeat, and converting a continent into a mere pleasure ground for friends whom no distance can now divide. (Great Applause.)

And this is not all, sir. You may enlarge as you will, and call about you the profoundest speculation, in all its variety, upon social and civil problems, upon "international intercourse and commerce," upon diverse faiths, and modes of government; but above all rises the thought that through instant communication men may now become one if they will—inspired each moment by the best sentiment, led like one family up to the highest and best endeavor. We may boast as we will of our victories and achievements on the battle field; we may cherish with fondest devotion the valor of our sons; we may bear in perpetual remembrance the heroic names which illumine our history from its dawn to this hour; but the greatest conquest of our age is that over time and space—a struggle whose fields are bloodless, and whose triumphs bring joy and gratitude to every heart. Armed now with his two great weapons of power and peaceful achievements, man may enter upon his field of labor. For him the mountains are brought low, and the rough places are made plain. Between his smiling continents a subdued and tranquil ocean rolls. The darksome pathways of the deep are traversed by his messengers, passing from shore to shore, swifter than lightnings from cloud to cloud. Forth from his ports his navies sail, led by the cloud by day and the pillar of fire by night; and the herald of their coming, on swift and silent errand, prepares their way before them. Oh! sir; *we* can never forget the names of those who have given us our greatness; but *the world* will never forget James Watt, who marshalled his fiery champions to "bloodless triumphs, not for the destruction, but for the service of mankind;" nor Franklin, who dragged the lightning down from heaven; nor Morse, (loud cheers;) who harnessed it to his chariot of peace; nor Fulton, the earnest and thoughtful, who triumphed over winds and tides; nor Field, the untiring and indomitable, who, uniting the two great forces of steam and magnetism bound by a chain instinct with life the two great nations of the earth together, as I trust and believe for "international intercourse and commerce," which may be the beginning of man's triumph over all causes of strife, and his progress towards the most humane and Christian civilization. (Applause.)

Sir, I would not expect too much. But I ask this distinguished assembly who are with me on this platform, men who have given our country a high renown in arts, and science, and letters,—I ask them to remember the power of great attainment to secure the attention, and win the affection of mankind. How the scholars and philosophers of the ancient days drew all men about them, and made their age immortal! How Raphael and Michael Angelo set an age of art! How Shakspeare and Milton fixed an era of letters! How the Puritan planted his great protest on the shores of Plymouth; and how there has sprung up generation after generation of men from his time to our own, whose work in establishing a republic of human freedom and equality, has warmed the hearts of the people and weakened the grasp of the tyrant! It cannot be possible, then, that the achievements of scientific investigation, applied to man's mental and material condition, and especially to human intercourse, can fail to occupy his best thought and call for the highest endeavor. While every important public event reaches instantly the popular ear, and a popular response is as instantly given, the general mind must be powerfully drawn towards those things which concern most immediately the welfare and prosperity of the community. For the benefit of trade, commerce, interchange of thought, all the arts of peace, are the great inventions for transport and communication especially designed, and so long as the condition of the markets throughout the world is known hourly at the great centres of trade, and the last declaration of the statesman and the newest thought of the scholar are borne to the ends of the earth almost as soon as uttered, it must be the industry and thought of the world which receives the largest share of our attention. Under cultivation like this, the popular demand is that war, if it comes at all, shall be short and decisive, and that peace shall be long and honorable. (Cheers.)

And then, sir, what a world wide fraternity this constant communication naturally creates. The chilling influences of time and distance are all gone. Yesterday's disasters, wherever they may have occurred, thrill and pain us to-day, as a message of sorrow from our nearest neighbor. All mystery and doubt with regard to passing events and their influences are ended; the events occur, are received, weighed, set down in a moment, and in a moment we pass on to the next. Nations are brought to each other's thresholds—and ambassadors can utter each day the voice of the government to which they belong, and communicate the reply from that to which they are sent. The boundaries of states and empires may remain the same, their tongues may differ, their social and civil conditions vary; but united as they are into an international community intimate with each other's wants and necessities and interests, how can they long remain antagonistic? No, sir; quarrels between nations are fast becoming family quarrels, attended by all the ruin and misfortune which usually follow such unhappy dissensions. And these relations are fast becoming so intimate, that the doctrines and institutions of the wisest and best and most vigorous, must in the end prevail. I believe, as I know you all do, that the successful valor of our sons on the battle fields of the rebellion, not only gave us a country, but also gave that country power to demand right and justice from all its brethren in the family of nations. But I also believe that we owe much to the constant interchange of thought and interest to the daily intercourse between the leading minds of England and America, for that condition of mutual respect and regard which has led her on to justice and fairness, and us on to peaceable and honorable arbitration. And let us not suppose that this is to stop here. A good example is never lost. Can we imagine that those nations now drenched in blood spilled for national supremacy, and, victor and vanquished, both farther than ever away from free institutions and popular elevation, can shut their eyes to the benignant influence of our peaceful adjustment of difficulties far more intricate than theirs? If they will do this, let them gaze into the future, and behold two great and powerful nations, one in language, one in blood, one in traditions, and in an inheritance of thought and deed—now more than ever one in friendly progress towards prosperity and power. Then may they behold an American republic occupying this entire continent, not by conquest, but by the attraction of high national virtues, and the fascinations of brilliant success. And I solemnly believe that they may behold, moreover, an alliance of pacific industry, which will one day create a circuit for itself encircling the globe. To the spot where I now stand, from the Pacific seas eastward across a great Continent, and westward through the great Exchange the currents of trade now flow incessantly. And it is not too much to believe that as the American people increase in numbers and wealth, and their means of communication multiply, they will control the channels of trade, and that in the adopted city of the great inventor of the magnetic telegraph, will gather that concourse of merchants who shall hold in their hands the exchange of the world. Along paths like these shall the American people advance to their well earned position among the nations of the earth, and realize that international intercourse which honor and justice can create. (Cheers.)

And now, Mr. President, I desire to express my thanks to your committee for the opportunity they have given me to participate in these proceedings, with all their brilliant associations. In the short space of time allotted to each one of us, I could only enter upon the threshold of the great theme assigned me. Leaving it, therefore, to be explored as it deserves by an intelligent community—I congratulate you the telegraph laborers of this great continent upon the great success of this occasion; I congratulate the city of New York, that to her has been given the opportunity to do honor to a distinguished son of Massachusetts, born beneath the shadow ot that shaft which records the early valor and patriotism of that ancient commonwealth; and I congratulate that son upon the distinction he has achieved and upon the respect and esteem which wait upon him, as upon all the good and just, amidst the shadows which fall upon the evening of life. (Cheers.)

An amusing episode occurred in the middle of Dr. Loring's address, which somewhat staggered that worthy gentleman. In the very hight of one of his finest sentences, at a point when an intelligent audience is usually quiet and attentive, an immense cheer broke out, which lasted for some time, caused by the entrance of Hon. Horace Greeley upon the stage in summer costume. The farmer of the Tribune received a right royal welcome, and it did not detract a whit from the zest with which Dr. Loring's speech was received.

After Dr. Loring's address, Mr. Orton announced that the band would play the Morse Telegraph March, compared expressly for the occasion by band-master Wiegand, and which was received with great applause.

Dr. Samson was then introduced, and spoke as follows, subjet "The Telegraph and Literature:"

DR. SAMSON'S ADDRESS.

Poets are prophets, because they are philosophers. So the Greeks instinctively believed, as their names indicated; and so Plato argued. The law of the universe is harmony; and the heart that feels its beauty must be guided by an intellect that sees its truth. It was natural that Pythagoras, the leader in Grecian idealism, should have anticipated by two thousand years the discovery of Copernicus; that Lionardo, the master artist, should have conceived, three centuries ago, the theories of modern geology; and that Goethe, the most spiritual of poets, should have announced the true scientific principle of classification in natural history. The forecaste of reason in Newton and Faraday is nothing else than the creation of a happy fancy. The poet is prophet, because he is philosopher.

From Homer to Milton, the epic poets have conceived that the sunbeam, Aurora's flash, and the lightning's bolt are messenger-vehicles of superior spirits. The bolder dramatists, from Æschylus to Shakespeare, have imposed on the credulity of their readers with the picture of sprites that could "put a girdle round the world in forty minutes." The poet's dream in our day is realized; the highway girdling earth is found in the telegraph wires; and the chariot of the gods is the one common agent detected in the sunbeam, the aurora, and the electric flash. (Applause.)

The poet is master in literature as well as prophet in science. The new power for the exchange of thought, then, foreshadowed by the poet's fancy, must, now that it is realized, have an effect manifestly adequate, and resulting from such a cause.

Lord Bacon looked for the day when, to the stores of digested principles, gathered first in civil, and, second, in natural history, a third department, namely, literary history, should be provided. The idea of Lord Bacon is a profound suggestion. As all science begins with collated facts in nature, and all poetry with the incidents of individual human experience, so all literature begins in journalism. The ancient rulers of Egypt and India, as of modern China, had a cherished *literati*, whose sole employ it was to gather, to collate, and to digest chronicles of every important passing event. The journalists of advancing civilized nations are the lineal successors of these ancient chroniclers. As from those ancient storehouses Moses and Herodotus drew their material for history proper, so from the same exhaustless fountain the poets themselves have drawn. What a conception we get of the blind old bard of Scio, when we think of the boundless labor necessary to the collection of the facts which enabled him to picture, with such perfect truth, every scene of beauty in every land lying about the wide Mediterranean. The world have asked whence Shakespeare drew the ever varying sketches of men and scenes in so many a land and age; and it is demonstrable in principle, if we had not learned the fact, that Shakespeare had read everything which the guileless chroniclers and simple-minded journalists had recorded. The literature of an age is its choice selections from the groupings, the reasonings, the fancies, the creations of master minds; all of whom have drawn both substance and form from the reporters of the day, rendered subservient to their work. Lord Bacon's idea of literary history was a part of his inductive system, which made the substratum of everything worth preserving to be gathered from wide-spread observation of existing realities. If there is any gift from nature, from man, or from the Author of all, that can give new skill to genius in weaving the warp of fact and the woof of fancy into webs of new beauty, to be hung in the Mecca-halls of our nation's growing literature, it will be the boon received from the "Father of the Telegraph." To the proof.

Most, if not all, the great advances made in a nation's literature have sprung from new methods of recording and diffusing the writer's productions. When Cadmus carried letters into Greece, relieving the mind of the bard from the intolerable load laid upon memory, the lyric and ballad towered at once into the epic and the drama. When printing stood ready to give a cheap heralding to the elaborations of the pen, then the spring of German literature immediately began. So, too, when the telegraph permitted the most distant and instantaneous intercommunication, a new inspiration began at once to spring up amid the new life; and journalism and literature have taken on new and most palpably improved features.

First. The telegraph has widened the range of human thought and observation, and has thus given new *comprehensiveness to literary furniture.* Not journalism alone, as some suppose, has been revolutionized in character by the telegraph; but almost every man engaged in commercial and industrial pursuits will tell you that he has been obliged to begin anew the study of his life's employ. The man of science is now collating, even, the elements of atmospheric changes, and is forewarning the traveller and the merchant what weather to expect on the morrow. The statesman takes no move on the shifting board, all whose changes must take shape from the current of public opinion, till he has heard the echo of the "vox populi" along the telegraphic wires. And even the essayist of modern days, who in England's Johnsonian age utterly failed except he were *graphic*—even the essayist will be left behind by his readers unless he takes on a completeness in sketching, which may deserve the name of *telegraphic.*

Second. The telegraph has compelled selection of the special and salient points in every subject reported, and is thus giving a *compact and terse framework* to modern literature. Where are now the four column editorials of the last generation; and where sleep the thick octavos of former days! The sheets have multiplied; but the breaks and new headings make the journalist's page a checkerboard. The folio and its successor the quarto, and its follower the octavo, are driven from the field by the duodecimo. And, turning from outward to inward marks, what editor, that once could doze in his arm chair, is not, by the stinging application of the electric reports, started into the quick step and into the life, if not grace of movement, demanded by our hurried age. The writer for the monthly magazine, too, and the heavy-drag quarterly reviewer, have felt the impulse; and short, pithy paragraphs, with the wide life of the world crowded upon a page, is the demand, and therefore the supply of our day. And, indeed, probably all would admit that a Walter Scott, in our day, would hardly dare to avow that he had written a biography in three octavo volumes, because he had not the time to write it in two volumes.

Third. The closer acquaintance men make by the telegraph, is giving a *tone of truer catholicity, and of purer humanity to our literature.* Mountains interposed make enemies of nations, *because* they are a wall of non-intercourse. Error is always partial truth, and bigotry half religion. Sectionalism and sectarianism are always local; and rivalries and jealousies, the strife of the pen and of the sword, arise from misunderstandings of distant neighbors. Every agent which brings men into virtual proximity, makes men more *one.* The telegraph, in more than figure, rends the rocks asunder, and even realizes the celestial vision, "There is no more sea." He must be a heedless observer, who does not see the growing nearness of thought and sentiment into which first the railroad and steamship, and now the telegraph is bringing the States of out Union, and even the mother-land with her daughter of the West. Mrs. Trollope could not be repeated by Dickens; nor would Dickens have written as he did twenty years ago, had he lived in the days of the perfection of the telegraph.

Fourth. The power of human mind over the elements of nature, culminating in the telegraph, is giving *a tone of higher spirituality* to our literature. It was no chance that caused the first message over the telegraph wire to be these words: "What hath God wrought?" For two reasons, the telegraph is making literature more spiritual. A new metaphysical element is silently at work, correcting the heartless materialism of our day. As Franklin intimated, the physical world opens a new and border region between the contending hosts of idealism and materialism; a common highway, on which men of different mold are meeting, and are there finding and rejoicing in their kinship.

Thus a new world of practical metaphysics is found; it lies in that golden mean that avoids both extremes—in the intermediate field of the physical, which, sufficiently etherial yet sufficiently palpable, bridges over—as the profoundest minds, from Aristotle to Franklin, have believed—the abyss which only seems inseparably to divide matter from spirit. Yet more: there is a moral influence on our human nature, awakened by such power on earth as man gains in the telegraph. As the young sage of the earliest times, on the Euphrates, recognized in his inner consciousness a truth which he could not but utter—"There is a spirit in man, and the inspiration of the Almighty giveth them understanding"—and then, as his keen eye, strained northward, caught before others around him the first slight movement of the rising storm-cloud, and, in substance, exclaimed, "God is coming to speak in the whirlwind, and men see *Him* not, *because* they see not the bright light in the clouds," so every eye that now scans to its depths the profound of the physical world, brought nigh by the agency of the telegraph, believes, and, therefore, to be honest, avows his belief, in a Spirit greater still, curtained behind the pavilion of the sky. And more: just in proportion as man gains the power to sway the elements of the physical universe does he find his own likeness, in some attributes of his character, to the Supreme Author of all; and to that extent he yearns the more to be, in all his nature, conformed to the image of his Maker. The telegraph is pre-eminently an agent which has introduced more spiritual elements into our literature.

To-day we have come to acknowledge as a community our debt of gratitude to the inventor of the greatest instrument of power over earth which the ages of human history have revealed. We are wont to think and say that Republics are tardy and unappreciative of true genius; and especially is it a maxim that Republics are ungrateful. Say rather, that Republics are careful to scan professed superiority because comparatively unselfish, while, too, they are surest to give the full measure of perpetuated praise to merit that stands the test of trial. Monarchs are quick to see what, if available at all, must be employed at once for their selfish ends; and aristocracies put a star on the breast to be scanned with vacant gaze by a people that would see nothing in the hero were it not for the brilliant. Republics are guarded in precipitating honors, lest even the man of worth should be made dizzy by premature exaltation; the garland of the poet laureate fading early because its flowers were gathered while the dew was on them; and the great artist being seduced into the path of gold-greed by too early handling of the wealth which success brings. Not too early, not too late, did triumph come to America's greatest inventor. Time had already begun to silver those locks—now like Hermons's snow the white that at once veils and reveals the green beneath—the Father of the Telegraph was already gray before the first pæan in his praise arose. Is it not enough, it *is* enough, that such an ovation as this of to-day has come while yet the patriarch lingers on the verge of that bourne which is but the portal to the eternal temple of true glory. (Applause.)

New York, the great material centre of our great country—so to remain necessarily, whatever other centres are developed in this home of the nations—New York has done well in her tribute to-day offered. But the greater moral centre, with such a name! with such a *fame!*—home where the Father of his Country believed his countrymen would forever come to remember him—shrine where the only true devotion of American nationality can be paid—Washington, must do better. In your Park the great inventor stands alone, the emblem of his perfected work suggesting but one idea. The comprehensive thought which framed to-day's programme, saw that every interest of our humanity clusters around the power working through the telegraph. No great man ever stood alone. No man is a great man who does not feel himself a finite creature, an humble member of a numberless insect family, each one of whom is indebted to his fellow, and all dependent on a common Father, author and giver of all. The inventor of the telegraph has, as his chief attribute, the only one higher spirits deem heaven-like, this recognition of his common humanity and of his infant-like dependence. No man is ever anything but the product of his age; and if any man tower high among his fellows, it is because the great throng and press of generations before, of associates at his side, and of successors behind, have forced him to his eminence; for in this, the law of body and mind is kindred. Let then our venerated father be lifted higher than he can stand on the heights of your park and alone on the single pedestal. Let the proposed monument to American inventors, with Morse at its head, rise at the National Capital, close by the vast halls where the nation has clustered the treasurers of technic art, the product of universal American genius. Let the granite pedestal show in its panels the men of science, of enterprise, of fortune, and of letters, who lifted from the earth, and bore on to success, their guiding leader. Let the shaft, towering above, fling out in higher relief the forms of Franklin and Fulton; and let the genius of each one of the four continents stand on the pedestal corners, and bow around in homage to the great masters who rule them. Then let the climactic form, with his climactic work, rise sublime above; twice exalted, because high among compeers that stand worthily with him, and because lifted there, not by the gifts of a class, but by the offerings of a grateful nation. Then will the monument perpetuate what we to-night recognise; the relation of the telegraph, not simply to science and art, to commerce, and national defence, but also to literature and journalism, to civilization and christianity. (Applause.)

THE FAREWELL WORD.

Mr. Orton now announced that the hour of 9 P.M. had arrived, and that all the wires of America were connected with the instrument before him. It was a sublime thought, that the touch of a finger on a tiny key, in the New York Academy of Music, would so soon vibrate throughout the continent. The audience seemed to see the 10,000 anxious faces looking down on the instruments in every town of the new world, waiting the expected sound. It caused intense silence. Miss Sadie E. Cornwell a young lady of much attractiveness of person and manner who had been selected to transmit the message was then conducted to her place by Mr. Applebaugh, and sent the following despatch, every operator watching the manipulation in a stillness which was most impressive. The message was as follows:

GREETING AND THANKS TO THE TELEGRAPH FRATERNITY THROUGHOUT THE WORLD. GLORY TO GOD IN THE HIGHEST, ON EARTH PEACE, GOODWILL TO MEN.

At the last click of the instrument Professor Morse, escorted by Mr. Orton, approached the table and took his seat. As his fingers touched the key, tremendous cheers rung through the house, but were stopped by a gesture from Mr. Orton. Again that impressive silence fell on the house. Slowly the sounder struck "S. F. B. Morse," the Professor's hand fell from the key, the entire audience rose, and a wild storm of enthusiasm swept through the house, which was continued for some time, ladies waving their handkerchiefs, and old venerable men cheering as joyously as the youngest. Professor Morse, visibly affected, resumed his chair beside the President, and for several moments pressed his brow with his hands. The whole scene was thrilling and impressive. The tableau, the aged happy Professor, Miss Cornwell wreathed in smiles, Mr. Applebaugh, handsome and exuberant, has furnished a subject for Leslie, and of which he took advantage, seldom awarded to an artist. When the excitement and applause had subsided, Mr. Orton said:

"Thus the Father of the Telegraph bids farewell to his children."

The current was then switched off to an instrument behind the scenes.

Quickly along the wires came the following responses:

FROM MILWAUKEE.

Milwaukee sends greeting. The heavens declare the glory of God. The firmament showeth His handiwork. Day unto day uttereth the speech, and night unto night showeth the knowledge; your lines have gone out throughout all the earth, and your words to the end of the world.

FROM JACKSONVILLE, FLA.

Greeting: The glory of God, whose hand furnishes the lightning, has been reflected in him who has been honored as His agent in making the lightning the servant of man.

W. H. HEISS, General Superintendent I. O. Cable Co.

FROM MONTREAL.

The Montreal Telegraph Company rejoices that Professor Morse is securing, in his lifetime, the acknowledgments and benefits of the value to the world of his great discovery. May he long enjoy them.
HUGH ALLAN, President.

FROM TORONTO.

The telegraph fraternity of Ontario congratulate Professor Morse, and trust that the statue to-day unveiled may prove an incentive to genius for all time to come.

H. P. DWIGHT, General Superintendent.

FROM QUEBEC, CANADA.

Quebec congratulates Professor Morse on to-day's event.

E. POPE, Manager.

FROM CHICAGO.

A thousand flashing wires to-night
Meet in one circuit—grand, complete—
And o'er them, with the lightning's pen,
We write our father Morse to greet.

But we, dear chief, a circuit form
Which far excels th' electrician's art.
Affection's battery warms the line,
Each "cup" a telegrapher's heart.

Repeating stations there are none;
Unbroken flows the electric stream
That bears you this eventful night
Our love, our reverence, our esteem.

CHICAGO OFFICE.

FROM WASHINGTON.

May the God of Storms bless you, and make your path on this Earth all sunshine. After this Earth, peace.

ALBERT J. MEYER,
Brigadier General, Chief Signal Service United States Army.

FROM NEW ORLEANS.

Him whose lightnings have enlightened the world, whose ways are in the sea, whose paths are in many waters—To Morse the telegraphers of New Orleans offer their congratulations. For the fraternity.
DAVID FLANERY.

FROM PORTSMOUTH., N. H.

The Old Colony sends you joyous and kindly greeting. May your laurels be ever green as the memory of the Fathers, and your fame as enduring as Old Plymouth Rock.

C. C. DOLEN, Manager.

FROM LOUISVILLE, KY.

Kentucky, whose jurists near a quarter of a century since first vindicated your legal title against all pretenders to the immortal fame as the inventor of the electric telegraph, to-day proudly rejoices to see the whole civilized world in affirmation of her judgment so unanimously and enthusiastically award you a place among the noblest benefactors of mankind. *Serus in cœlum redeas.*
LOUISVILLE.

FROM WASHINGTON.

The capital of the nation, the scene of his earliest triumphs, sends greeting to the father of the telegraphic fraternity. May the "circuit" of his fame thus completed never be broken.

WASHINGTON OFFICE.

On behalf of this office allow me to congratulate you and your assistants upon the success of Professor Morse's feat. It passed South on every wire, and I have two registered copies taken in presence of the whole newspaper representatives at the capital.

To General T. T. ECKERT, Superintendent. C. A. TINKER.

FROM PHILADELPHIA.

The world's great benefactor—Professor Morse—famous in art, distinguished in photography, and immortalized in the telegraph.
ABRAHAM BOGARDUS, President.

E. L. WILSON, Secretary.

FROM CHARLESTON, S. C.

From the far South we send back the kindly greeting of our father in telegraphy, and with our brothers of the North, East and West uniting in making up the circuit of praise to him whose genius devised and whose patient energies worked out this the grandest invention of the nineteenth century.

JOHN D. EASTERLIN, Manager.

FROM OTTAWA, ONTARIO.

The operators of the capital of the Dominion congratulate the Father of the Telegraph on the inauguration of his statue, and trust he may be spared many years to look with just pride on that token of the esteem and affection of his numerous telegraphic children.
N. W. BETHUNE, Manager.

FROM SAN FRANCISCO.

The telegraphers of the Pacific coast send greeting and the heartiest congratulations to the Father of the Telegraph.

FROM PITTSBURG.

All honor to the inventor of the electric telegraph. He needs no monument of brass or bronze to perpetuate his memory. It will live while the electric telegraph keeps pace with time.

PITTSBURG, PA.

FROM MEMPHIS.

As ancient Egypt accredited to the statue of Memnon the poetic honor of giving oracles to the Nile by heralding the Sun in his coming with strains of sweetest melody, we of modern Memphis may congratulate yourself that the statue of Intelligence and Truth goes to all the generations that are to succeed us. In this spirit the telegraph craft of Memphis most heartily congratulate you, sir, on the inauguration of the Morse memorial.
JAMES COLEMAN, Superintendent.

FROM CINCINNATI.

The telegraphers of Cincinnati rejoice that Professor Morse lives to witness the honors this day conferred upon him, and express the hope that he may be spared many years to see the future triumphs of the "art communicative."

CINCINNATI OPERATOR.

FROM MOBILE, ALA.

Mobile desires to join the fraternity in other States and countries in paying tribute to to-day's happy event in your honor, and to add our congratulations to the father of the telegraphic world.

FROM HALIFAX, N. S.

Nova Scotia, fully recognizing the genius and worth of Professor Morse, enters heartily into the rejoicings of the occasion. The President and Executive of the Nova Scotia Electric Telegraph Company, in conjunction with the officials and employees of the Western Union Telegraph Company at this section, request me to convey to the venerable Professor their sincere regards and best wishes, together with the hope that the day and its object may long be commemorated.

W. H. WISWELL, Cashier, &c.

FROM HAVANA.

Al Illustre Professor Morse:

El centro telegrafico de la Habana, recibe con entusiasmo el telegrama que se sirve dirigirle al eminente Professor Morse, amigo de la humanidad y de la civilizac on debe llamarse des de hoy el mundo scientifico pues sto el ruido de la fama sin los alardes patrioticos de la politicaniel estridente fragor de los combates habeis dado a la humanidad y a la civilizacion magores dias de lomarcesible. Gloria que otras atteias del progreso humano recibid pues la cordial felicitacion que en nombre del cuerpo telegrafico Cubano os derigo.
E. DE ARANTAVE.

The following despatches were received later in the night:

FROM THE HONG KONG CHAMBER OF COMMERCE.

HONG KONG, June 11—1:18 P. M.

President Chamber of Commerce, N. Y.:

The Hong Kong Chamber of Commerce compliments its sister organization of New York on the successful completion of telegraphic communication, which now extends more than two-thirds round the globe, and brings China within speaking distance with the American Republic. Professor Morse, who is your guest this evening, has lived to see one of the greatest triumphs of telegraphy, and the Hong Kong Chamber join you in doing honor to one whose name will always be associated with this great work. For the Hong Kong Chamber of Commerce.

NOEL BLAKEMAN.

FROM THE BOMBAY CHAMBER OF COMMERCE.

BOMBAY, June 11—8:11 P. M.

To the Chamber of Commerce, N. Y. :

The Chairman desires to express through you to Professor Morse his appreciation of the great services rendered to the world by his invention for improving the method of communication by electric telegraph in all quarters of the globe.

BOMBAY CHAMBER OF COMMERCE.

FROM THE SINGAPORE CHAMBER OF COMMERCE.

SINGAPORE, June 11.

To the Chamber of Commerce, N. Y. :

This Chamber desires to share in the honor done to Professor Morse for his eminent service in telegraphy, and present their sincere congratulations and good wishes.

SINGAPORE CHAMBER OF COMMERCE.

The Chairman then introduced Gen. N. P. Banks, who was to speak of the Telegraph as a National Defence, and who was received with cheers.

ADDRESS OF GENERAL BANKS.

One of the most eminent contemporaries of the First Napoleon describes him, in the preliminary operations of his great battles, as sitting under cover in fire, his watch in one hand, the other deep in the pocket appropriated to snuff, giving orders, receiving reports, until the moment his forces began to move, when he fixed his eyes in one direction, despatching couriers, intercepting messengers, until he received the information, impatiently awaited, that a position had been carried, an outpost taken, a height firmly held by the designated corps. Then he quietly returned his watch to its pocket, discontinued snuff, conversed pleasantly even jocosely, with his officers, and confidently waited the issue of the contest. The fortunes of the day had already been decided; the battle was over; the enemy annihilated; the victory complete when his orders were executed. This they called "*La grande guerre.*"

Eulogizing the genius of Alexander and Hannibal, he thought he might himself stand third in the list of great captains. Thiers, the historian, ranks him second only to Hannibal. Considering the age in which he lived, the genius and power of his adversaries, and the stupendous results of his early campaigns, we may, without injustice, regard him as the greatest soldier of any age.

He did not organize his army in accordance with the military theories of his time, when each corps was substantially an independent command, with its separate supports of artillery and cavalry. There was but one chief in his army. It was, in fact, but one corps. He held himself, in his own hands, as separate forces, its infantry, artillery and cavalry, and hurled them, at the critical moment, as so many thunderbolts, one after the other, at the doomed positions of the enemy.

His improvements upon the systems of the great soldiers that preceded him entitle him to rank as a discover in military science. His conceptions were transcendent, but they far outran his power of execution. His genius seemed of supernatural origin, but in the execution of his plans he sometimes scarcely exceeded the capacity of ordinary men.

It was his invariable habit to inspect in person the positions of his forces. When he did this his armies were invincible. The slightest relaxation of this duty imperilled their success. Such negligence at Birnstein threatened the success of that great campaign which culminated in the victory of Austerlitz, and it is well known that his inability to perform this duty at Waterloo was a principal cause of the crowning defeat which terminated his career.

His victories were achieved while his troops were the instant subjects of his orders. When he entered upon the distant compaigns of Egypt, Spain, and Russia, where his personal influence upon his troops was imperfectly maintained, his power waned and his empire was overthrown. He could no longer stand, watch in hand, counting the moments when the eagles of France were to be crowned with victory. The actual situation could not be reconciled with his ideal conceptions. There was one power wanting. It was that almost supernal power which the genius of MORSE afterwards revealed to an astonished world. It was the use of the electric telegraph as an agent and engine of war. (Applause.)

"He would have changed the face of the world, when in Egypt," he said, but for the capture of his vessels by Sir Sidney Smith. The error of the French admiral was, after weeks of indecision, in standing out to sea, instead of running into the Egyptian ports. An earlier development of the genius of Morse, and the honorable enterprise of FIELD, might have changed this passage of human history. (Cheers.)

Nothing so well illustrates the importance of the telegraph in war, or the helplessness of the greatest commanders without it, as the career of Napoleon. The limited physical power of man is inadequate to the execution of the almost divine conceptions of his mind. This fact exposes the absurdity and sin of individual aspirations for universal dominion. The subordination of the power of the telegraph to his control might seem to justify such aspirations. But it would still be insufficient. It is in "apprehension" only, and not in execution, according to the great poet of Nature, that man is "like a God."

Soldiers in every age have sought a solution of the problem of telegraphic communication. The Roman generals were able to spell words and form simple sentences by the aid of fires made of different substances. The American Indians marked their war path by signal lights upon mountain summits. The French in Algiers, constructed nocturnal telegraphs of colored lanterns. Long after the invention of the electric telegraph by our great countryman, the Signal Corps of the American army employed flags by day and flaming torches by night for the same purpose. The historic phrase, "ALL IS QUIET ON THE POTOMAC!" was first transmitted in this manner from the Upper Potomac by the summit of Sugar Loaf Mountain in Maryland to the Capitol at Washington. Frequent repetitions afterwards made this sentence a subject of thoughtless levity; but there was a period when it greatly relieved the anxious hearts of all the rulers of the country.

The electric telegraph was first thoroughly successfully tested as an agent of war, in the contest between Italy and Austria, in which France was an ally of Italy; and it is not too much to say, that the independence and unity of Italy is in a great measure due to the influence of the telegraph, then first made subservient to the uses and necessities of war.

In the great struggle which has just closed between Germany and France, the electric telegraph was employed in every important act, from the declaration of war to the proclamation of peace. Diplomacy abandoned its turgid despatches and protocols, for the sharp, concise, comprehensive style of the telegram. The hostile Emperors communicated with the nations they defended, by telegraph. So far as the events of this war were concerned, the journal of the civilized world were conducted with the aid of the telegraph. The final union of the German States was effected by telegraph. It is scarcely irreverent or extravagant to say, that prayers and thanksgiving were offered through its instrumentility. During the military operations of both armies, field lines were laid with the facility of an amateur surveyor, in pacing the grounds of a base ball club. The marvellous combinations by which the victorious Germans imprisoned army after army in the fortresses of France, and hurled the remnants of her defeated forces upon the territory of neutral States, until unhappy France was left for the moment, without an armed man for defence, were effected by the telegraph. It was the genius of MORSE that made such combinations possible. Cheers.) Needle guns, chassepots, breech-loaders, and the mitrailleuses, are dangerous instruments; but the electric telegraph is the only deadly weapon. (Applause.)

In our recent memorable struggle for the preservation of free government, the telegraph performed an important and patriotic part. The telegraph, railway and steamship, the grandest reinforcements which applied science, has given to the art of war, were never so thoroughly and triumphantly utilized, as a means of national defence. Those who served in distant parts of the country, where the telegraph was impracticable or impossible, best comprehend its importance. The momentry suspension of telegraphic communication, between the capital and the loyal cities of the North, excited general consternation. It was the constant telegraphic communication from the Government and army, that reassured the people, bound the loyal States together, and stimulated civil and military authorities to greater exertions, by the almost limitless contributions of men and money, to the cause of the Union. Throughon the contest, it was the chief medium between the Government, the army, and the people.

It was, in truth, an electric nerve that united them, consolidated their power, inspired them with courage and hope, and finally led them to victory. It was the trusted agent in all great movements, civil or military; the foundation of every triumph, partial or general. Thirty million people were united by new and unaccustomed ties; electric chains of celestial fire, flashes of etherial and supernal light, touched, thrilled, instructed, fortified, illumined every soul. It was the chord of the national heart. Overburdened by sorrows, it might have broken, but with this support it was always ready for greater sacrifices, and beat with higher and nobler aspirations for the cause of universal liberty. The humblest citizen of the Republic will remember it as the instrument, that, morning noon and night, renewed the determination and courage of the people, and every soldier will gladly attest to the great aid it gave the defenders of the nation, from the satanic assault on Sumter to the surrender of the Confederate armies to General Grant, which ended the war. (Loud cheers.)

But war is not the only means of national defence. There are perils, within and without, beside those of rebellion and invasion. That which promotes universal peace is the surest and best defence of nations. Looking at events of our day, it might, indeed, seem that war was the natural condition of man. In twenty years past, the most refined, progressive, enlightened States of the civilized world have sustained almost incessant war, and the horizon of the future, is without promise of permanent or general peace. To correct this condition of things is the nobler work of the electric telegraph.

War is not more natural, but it is easier than peace. Of a society of ten persons, one can make war—the unanimous concurrence of all is necessary to peace. War is a calamity for victors and vanquished. It is the product of ignorance, treachery, rapacity and violence. It is no more essential to nations than the privilege of personal assault, or the duel is to individuals, which have been suppressed in nearly all Christian communities.

The antidote for war is intelligence, justice, and a regard for the common interest. What single agent within the control of man, does more for these objects than the telegraph. There is one element, for the suppression of private and public crimes, which it especially supplies.

Ecclesiastical authorities have expressed surprise, that the doctrine of future rewards and punishments should exert so slight an influence upon human conduct. The error is less, probably, in the Divine economy, than in speculations of men. But in worldly offences, at least, it is necessary that the consequences of crime should be instant and certain. If an assassin comprehends that the return of the blow which immolates his victim will strike him dead, he suspends his purpose. More than any other agency, perhaps, the telegraph furnishes this antidote for the ignorance, treachery, rapacity and violence, which are the seeds of crime and war. A man contemplating crime, dreads first and most, the telegraph. He may insolently confront accusers, corrupt witnesses, suborn public opinion, or divide with the police. But the telegraph is his mortal enemy, incorruptible, because universal. It is as if every stone and tree were endowed with speech, to cry out against him. To whatever quarter of the globe he may fly, it precedes and denounces him. Its influence, whatever it may be, is instantaneous and absolute, and it thus supplies the speedy and certain retribution for injustice and crime, of which all forms of society have been lamentably deficient. (Cheers.)

The Chinese, occupying for many thousand years an isolated and exceptional position among nations, jealous of the presence and influence of strangers, have too often sought relief from fancied evils, in the sacrifice of citizens of foreign States. In the ordinary course of events the Government is compelled to compensate, in some way, the atrocity of its subjects. But the lapse of time between the act and the retributive judgment, reluctantly pronounced, enables the guilty parties to escape, and the sentiment of the Empire remains unchanged, notwithstanding the simulated policy of repression and punishment. The telegraph reforms this condition of things. Such atrocities are now followed by an instantaneous and universal demand for reparation and punishment, from every State of the civilized world. While the blood of victims is yet warm, retribution is brought upon the criminals in person, or upon the communities that protect them, and the assassins are made to feel that the blow which smote the innocent destroys also the guilty. Under such circumstances even the "Heathen Chinee" is led to consider the interests of foreign nations, as a measure of protection and security for himself. Thus the telegraph, seeking reparation for injustice and wrong, reforms criminals, suppresses forms of crime which have been practised without responsibility or remorse for thousands of years, and at the same time elevates society and civilizes nations; and these are but incidents of its ordinary use in the transmission of intelligence.

The counterpart, complement and result of the telegraph are liberty, intelligence, and justice. These are the grandest elements of national defence. I trust I shall not mar the festivities of this occasion by expressing the hope that an agency of such varied and important powers may never be permanently monopolized by private parties for private uses, and that the Government will secure to all citizens the enjoyment of its manifold blessings, with the same spirit in which it protects all people in the enjoyment of personal liberty.

Complaint is sometimes made that people now read nothing but telegraphic despatches. So much the better for the people! A wise man is satisfied with the simplest statement of an event or fact. The ablest and most successful journalists instruct their correspondents to repress opinions and report facts. With the full record of the daily history of the world before us in this form, reflection and discussion may be left, in part, at least, to individuals, families, public assemblies, and the pulpit. It would be a calamity if our people were to depend for opinions or convictions upon hurriedly-printed journals, to which they turn for the current record of events. Journalists, who enjoy in the exercise of their profession the largest constitutional liberty, were the first to appreciate this truth and to conform their practice to its philosophy. We have only to contrast the philosophic and successful journalism of England and America with that of France, to appreciate the important part which telegraphic reports perform in the formation of public opinion.

There are sensations in life to which we can never become accustomed. The ocean is a spectacle we never witness without new conceptions of the majesty of nature; and everything that is grand and beautiful in life excites fresh sensations of delight, which kindle within us higher and nobler aspirations. Who can receive an electric telegram without emotion of this character? Whence comes it? What tidings does it bring? By whom inspired, and to what end? Reflection, memory, give no clue to its source or contents; instinct is at fault—immagination gives no relief. There is no point or quarter of the globe from which it may not have been sent, no event in the circle of life to which it may not refer. Through what devious and unknown courses has it passed? Over what mountains, beneath what seas. Across what deserts, by what dark defiles, has this magic messenger, borne on electric lines and impelled by we know not what mysterious power, made its silent way through crowded cities and populous States, its purport and object unknown except to the writer and operator; its secret held sacred and inviolable by all the world, unless, perchance, some Congressional Committee, should have been seized with unslaked thirst for the possession of "person and papers." (Cheers and Laughter.) Who can receive such an apostle of intelligence without a new sense of responsibility, and a renewed dedication of time and life to the principles of private and public duty. (Cheers.)

I have the honor to represent elsewhere the city which gave birth to the creator of the electric telegraph, the discoverer of the laws which control it, and the inventor of the mechanical processes which give it power. He drew his first breath from the pure atmosphere of Bunker Hill. It was well that the city which first successfully contended for universal liberty should have given birth to the creator of that power whose great mission is the diffusion of universal intelligence. We ask no endorsement of his capacity or character. The grand mission he was appointed, and the glorious manner in which he has accomplished it, speak to us for him. (Cheers.)

"Great offices will have
Great talents. God gives to every man
The virtue, temper, understanding, taste,
That lifts him into life, and lets him fall
Just in the niche he was ordained to fill."

Yet, nevertheless, we claim for ourselves, and for him, the recognition of the fact, that few achievements of human genius equal, and none surpass in importance, the creation of that power which enables us to transmit an idea or fact, at the same instant, to every quarter of the globe; and so far as reason prevails, or truth is dominant, compels the recognition of its truth and justice, by the great family of man. (Cheers.)

August and fortunate man! the benefactor of his race; the illustrious representative of the age in which he lives; who is permitted by Divine Providence to recognize and enjoy the fruits of his labors; to receive the unpurchased and unreserved homage of mankind; and at the close of his career, to find in the harmonies of the universe, the path to immortal fame! (Great applause.)

Mr. W. H. Pope, an elocutionist of much merit, was now introduced, and recited with excellent taste the following poem, by J. H. Watson, Esq., author of "Beautiful Snow."

POEM.

The quarter of a century; how light the footsteps fall
Of good old Time upon his rounds about this earthly ball!
The quarter of a century; a fraction of the span
Accorded by the Power on High unto his creature man!
And yet within that little space, those quickly counted days,
What monuments from human hands erected in his praise!
Man's teeming brain, and fingers deft, have swept the earth, and sea,
And bound the nations with one chain, where time no more shall be.

But hark ye to a simple tale that sounds like old romance:
Not one of steel-clad cavalier, and of a shivered lance,
But one of five and twenty years: of thought, and work, and prayer;
The story of a struggling man, and of a maiden fair.
And let this moral go before; great ends were never won
Save by the hearts that strive, and count their labor never done
For genius is another name for brave, persistent, strife
That knows no mission but the truth to beautify its life.

And as the hero of our tale must have a name, of course,
We'll call him—let us think a bit—suppose we call him Morse;
And then our lady, young, and fair, she too must christened be,
So Ellsworth seems a proper name that just occurs to me.
The scene shall lie in Washington, our struggling hero, there,
Has passed through years of thought, and work, of pleading and of prayer;
Of prayer into a nation's ear, for privilege to write
His country's name upon the scroll of Fame's eternal height.
But then this nation—sometimes deaf—half heard his urgent cry,
Till hope went from the struggling man, and left him—not to die!
A hero in a well told tale fights through the strife, and pain,
And always—like our hero Morse—when wanted, lives again.
On with the tale—he plead for aid to show the world the thread
To draw all nations into one, and stay Time's onward tread;
For aid to stretch his talking wire from thence to Baltimore,
A distance—so the story runs—of miles a double score.

But still his prayer remained unheard upon the closing day.
The morrow's sun would see his toils like dry leaves blown away;
Would see the makers of the law far on their homeward route,
And—he the hero of my tale—left there in sickening doubt.
That night he sought his weary couch, to sleep away his pain,
Scarce caring if the morning light should ever break again.
He counted all his wasted years, and all his aimless dreams,
Then slept until the morning sun awoke him with its beams.

Oh! blessed sun, that shines alike on pleasure and on pain,
And brings, oftimes, an angel in his glorious, golden train!
And so he did that happy morn, and Ellsworth was her name,
Who tidings of great joy on earth did to the world proclaim!
First she to tell the hopeless man, that on the midnight past,
His prayer had reached the nation's heart, was granted him, at last;
And as her guerdon for the news, expressed her heart's desire,
That she might write the first blest words across the talking wire.
The time swept on, the work was done, and all the world knew that
Potomac and the Chesapeake stood ready for a chat;
But still across the talking wires no clicking sound was heard.
Our hero waited on his pledge, for his fair lady's word.
It came, one simple, precious line, "What hath God wrought?" it said,
And from Potomac to the bay the wondrous question sped.
From Chesapeake no answer came, and back along the line
Was flashed, in lightning drawn from Heaven, the strange, mysterious sign.
"What hath God wrought?" the wires still ask, through five and twenty years.
The savage, in his western home, the lady's question hears;
The genii of the deep sea views the wondrous speaking coil;
The dusky Afric sees it cross his hot and arid soil;
But yet unanswered are the words; "What hath God wrought?" still stands
The question of the Telegraph to all the distant lands!
This only do we know, that God the wondrous thread has spun,
That breaks away the time and space and makes the nations one
(Applause.)

While Mr. Pope was pathetically reciting one of his best lines, a wild and laughing cheer arose which puzzled him as it had Dr. Loring, and which was caused by Mr. Greeley's exit. His summer costume was well starched, and on rising from his chair the terminus of his summer sack stuck up like a rabbit's tail, and his trowsers were drawn up above his ankles. It was a picture of the philosopher never before taken.

After some fine orchestral music by the band, Rev. H. M. Gallaher, of Brooklyn was introduced, and was welcomed with the heartiest cheers, showing that it was not the first time he had spoken to many present.

The address was received throughout with the heartiest demonstrations of applause, and could a speech have been encored, the audience would have had it over again. We do it for him; although it possessed much of its interest in the earnestness of its delivery.

ADDRESS BY REV. H. M. GALLAHER.

In the crypts of St. Paul's cathedral, London, these words are cut in the rock, over the dust of the great architect: "If you ask for his monument, look around you." The like thing may now be said of him whom to-night we desire to honor.

If you ask for HIS monument, look, not alone at the statue of bronze to-day unveiled to the people, but look at this multitude, each soul of which has been helped by his invention; and look also without at the statue, more enduring than brass, the myriad wiry lines which net and traverse your city, and stretch along your road beds, and slope up your hillsides, and underlie your rivers and harbors, and penetrate every town in your land, and carry daily messages to every reader in the community; look at those harps of a thousand strings on which your great guest has played so long and well, beginning, twenty-seven years ago, with the divine words, "What hath God wrought";—these are his monument, seen of all men and in all places. (Applause—cheering.)

The Telegraph, Religion and Civilization! Of these I am to speak. But how can one adequately discuss them in the brief division of time allotted to me. In half a score of minutes tell of these three great subjects, which are really bounded, as the American boasted his country was, "on the east by the rising sun, on the north by the aurora borealis, on the west by the procession of the equinoxes, and on the south by the Day of Judgment! (Great cheering.) This would be as surprising as the wonders of the telegraph itself. One can give but a passing glance and be done.

As to the connection of the telegraph with the world's civilization, it is not difficult to see that its work and help have entered into our daily life, and mingled with the joys and sorrows, the success and failure of our existence, and penetrated the obscurest ramifications of our business. By it alone come to us the immediate news of the world—from Europe and from far Cathay, from the battle fields and parliaments of nations, from the islands of the sea and from the uttermost parts of the earth. Paris is flaming with the oil-fed fire of her insurgents, and we read the particulars while the fire is still burning. Space is annihilated! We are next door neighbors to the Czar of Russia, and we talk, face to face almost, with the Brother of the Sun, the celestial emperor of the "Heathen Chinee." (Laughter and applause.) Panting Time toils after the Telegraph in vain—(applause)—and the angel of the Apocalypse is the messenger of the lightning, who stands, one foot on Valentia Bay and one foot on Newfoundland, and cries—"Time shall be no more!" (Loud cheering.) The love and affection of father and child—or, rather, mother and child, for the mother always loves more than the father, and ye American women, strong-minded as ye are, with all your faults I love ye still (laughter)—the love of mother and child, husband and wife, friend and friend, is ministered to by the telegraph, as it carries messages of recovery and prosperity, sends tidings of safe arrivals after stormy voyages, brings joyful news of escapes from moving accidents by flood and field.

Through it the mightiest interests of the commercial world are transacted; goods bought and sold, pushed forward or kept back, in that city in Europe or in this city in America. Grim-visaged war has discovered in it its most efficient auxiliary, great commanders have found much of their greatness in it, and the dignity of senates and of senators has been ruffled by its revelations. (Laughter and cheers.)

It is the deadly enemy of crime, and should be called the chief of all police. No fleeing of the criminal on iron roads or steaming to far-off islands will evade its silent but terrible pursuit. It is the avenging deity of the Greeks, whose feet are shod with wool (Cheers.) The atmospheric reports which foretell the coming storm and arrange the flight of ships or the preparations of pleasure parties, are only possible by the telegraph. No fire can break forth in our city, no mob collect, no accident occur, no pugilist meet to do his beastly battle, in which the telegraph has not a hand, and is the head and front of the offending. (Laughter and cheers.) In these and in a hundred other ways it has entered into our civilization, and penetrated our daily life, and become of the first necessity unto us.

Imagine some of the inventors of the olden time—Roger Bacon, Faust, Franklin, Fulton—revisiting the glimpses of the moon, and gazing at the telegraph as it did its wondrous work! How would the spirit of Guttenberg, who gave us movable types, the plague of ignorance, superstition and king-craft, rejoice at this amazing method of transmitting the sense of his printed words. (Applause.) How would the soul of Franklin, who tore the sceptre from the king of Great Britain and the lightning from the skies (cheers), exult to behold what has come of his first little efforts to control the lightning. "Of what use is it?" they said to him, when he spoke of his electrical discoveries, and he answered, "Of what use is a child?" And here is the child of Franklin full grown in the man Morse. "What hath God wrought?" (Great cheering.)

How the spirits of these men who toiled so persistently to make reason and the kingdom of God prevail, would rejoice as they saw this triumph of the telegragh, with its thousand iron arms embracing the round globe, carrying the sigh of love and the song of pleasure, and the cry of pain and the threat of hate, and the order of arrest and the news of escape, and the command of war and the tidings of victory, its ocean cable flashing these thoughts from continent to continent, the hand of Morse grasping the brazen bolts of great Jove himself, and hurling them to bear his errands with more precision and a thousand fold more celerity than Mercury, the fabled messenger of the Grecian gods. (Applause.) How they would gaze—those old inventors—at this last and fairest child of science, born of a Yankee, who outstrips Puck in his boast, "I'll put a girdle about the earth in forty minutes," and who gives a new reading to the old adage, necessity is the mother of invention, but a Yankee is its father. (Great applause.)

With our Religion, also, as well as our Civilization, has the telegraph much to do. The telegraph itself is a preacher of righteousness, for it is day after day showing us the unity which should exist among men, and proving to us the brotherhood of humanity. It is blessed with the blessing of the peacemaker. More than once has it prevented war, and if it had been known and used in 1812, there could have been no armed contention between this land and the mother country.

Often and often has it been like the angels of the Incarnation, the bearer of glad tidings of great joy, and in the struggles to introduce and establish it, in the unbelief and hostility its inventor and itself encountered, and in its perseverence in spite of all obstacles and its final triumph, it is the very counterpart of Christianity itself. (Cheering.) It is a vivid illustration of the Christian's prayer, for what is prayer but the spiritual telegraph of the soul. We send our words to heaven as we send our messages to Valencia, without knowing in either case how they are transmitted; and if the Master now walked with us as he walked the plains of Shinar long ago, perhaps we would hear him say, "Behold, the kingdom of heaven is like the lightning's message." (Applause.) The telegraph seems to be the fulfillment of prophecy, as the fiery iron horses of our railroads appear to fulfill these words of the prophet: "The chariots shall rage in the streets, they shall jostle one against another in the broad ways—collisions on the Erie broad guage, perhaps (laughter)—they shall seem like torches, they shall run like the lightning." So the wide-extending, earth-embracing metal arms of the telegraph appear to make plain the language of David: "Their line is gone out to all the earth, and their words to the end of the world." (Loud applause.)

Is there not some hint, also, in the wise and patient way in which men have tracked and tamed this swift and subtle thing called lightning—so subtle as to strike to death, and leave no trace of its blow, so swift as to traverse in a single second a distance almost equal to that which separates the earth and moon—is there not, I say, some hint in the mastering of this of the greatness that belongs to man, the immortality which is his?

When we behold this transmission of thought, winding along our valleys, outstripping our great hills and mountains, diving beneath our rivers, tracing the sinuosities of our highways and stretching away through the unseen caves of ocean (cheers), shall we not say, despite Darwin and his ape ancestry, (applause) "Thou, O Lord, hast made him but a little lower than the angels, and hast given him dominion over all the works of Thy hands." (Great applause.)

And to end, let us hope that the further advance and the completion and perfection of all science will be but the proof and fulfillment of the word of God. That the sciences which are now apart, and often antagonistic, shall one great day be gathered together and held in one by Religion. That as a girl gathers the scattered pearls of her necklace on a new or firmer string, so may we look for the day when the Lord of all shall collect the divided sciences of the world on the new and strong binding of Religion, and say, as He draws each to its place, "This pearl is History, and this Art, and this pearl is Poetry, and this Law, and this Science, and all are united and held together in Religion," and the motto of our States has become the legend of all the sciences and arts of earth, "E pluribus unum"—many in one—and that one the love of God and the Religion of Christ. (Enthusiastic and long continued applause.)

ADDRESS OF J. K. WALCOTT, ESQ.

Professor : I have a few words to say to you personally, although not privately. I am deputized by the operators of the United States to be present here this evening, to meet you and say to you a few words for them. Proud as I have always been to be one of their number, this day, sir, has been the proudest that I have experienced since, when a mere boy, I entered the profession. I know not what to say to you for them, unless I follow the promptings of my own heart.

When the movement for the erection of the Morse statue was first inaugurated, very few of us anticipated such a speedy and successful crowning of the effort, but when the plans developed themselves, and the operators saw the opportunity thus offered them to pay a tribute to so great and good a man, we responded quickly from our hearts as well as from our pockets, and when we sealed up our dollar for transmission to Mr. Reid, we also sealed a hearty "God bless him" to you ; and one of our number who, I suppose, in his ecstacy suddenly became poetic, wrote at the bottom of his letter :

"Father of all the Telegraphs," of thee we say,
That the great sun which rules each coming day,
As round the world it hastens in its course,
Gleams on Earth's wires the well loved name of Morse.
Come, then, ye people whom his skill hath blessed,
To him be now your gratitude expressed ;
And you, ye workers of the electric fires,
Sending the world's wants out on the mystic wires,
Let us unite and meet the generous call,
To "hang his likeness on the Earth's green wall."

And there, to-day, it has been placed ; there in our own beautiful Park it stands, girdled by the electric wires spreading to all parts of our great country. There millions and millions will pass and re-pass it, and with reverence gaze upon it. There the dying generation can go and bid good bye to science. There the rising generation can go, and in its shadow the young can learn to speak thy name. There we can go, and I am certain, sir, that none will look upon it with more reverence, with more pride than we, your children. There it will stand for all time ; the storms may rise but they will harm it not ; the fierce lightning may flash, but it will play gently around that noble form—its friend—for it was you who taught the lightning how to read and write.

With you, sir, your sun of life is now nearing the horizon ; with us—with the most of us—it has yet to reach the zenith. Rest assured, Professor, that the work which you so long ago begun, and over which you have so devotedly watched, will be left in faithful hands ; that the work which you have entrusted to us, and which I am sure you will say has been faithfully performed during your life, even so will it be performed when you are called from us.

And now, sir, in behalf of the operators who are here assembled—in behalf of the five thousand operators throughout the United States who to-night are resting from their day's labor ; in behalf of the three thousand operators who at this very moment are bending over their instruments, sending and receiving from all parts of the known world, over wires stretched through valleys, stretched over the mountain tops, buried in the deep, deep sea, their messages of joy and their messages of sorrow ; in behalf of all these, and with no unmeaning phrase or empty salutation, with pride that I am honored thus to stand in their stead and represent their affection ; with gratitude that thus, in the closing years of a long and honored life, so many of us are permitted to meet and honor you, and in the hope that many other years may yet be given you, and that each succeeding year will be brighter than its precedent, and in token of our high regard and deep affection for you, do now offer you this right hand, and may God bless you, Professor, and have you ever in his holy care and keeping.

Mr. Orton, in introducing the next speaker, said :

I would do injustice to myself and to you did I not acknowledge that to the gentleman who will now address you we owe very largely, if not wholly, the success of this day's ovation, and which you would probably never know did I not make the statement. He has performed the labor incident to the testimonial of this great day so persistently and so well that he eminently deserves that I acknowledge it thus publicly. I now introduce to you, Mr. Reid, who will address you on behalf of the ladies of the telegraph.

ADDRESS BY MR. J. D. REID.

I thank you for this hearty salutation. I know you all so well that it is not unexpected, and is very grateful to me. It comes to me as the interpretation of a mutual joy. I would, indeed, be wanting in ordinary sensibility did I not feel, as this day's delightful exercises close, a throb of genuine exultation. It means to me the close of most delightful toil. It means to us all the fruition of a most filial duty. I feel proud, to-night, that while the eyes of this venerable man and father still gleam with much of their youthful fire, although the twilight radiance of a better world is fast silvering his head for its brighter glory, the sons and daughters of the telegraph have this day honored themselves in doing Professor Morse most deserved honor. I feel glad that there is one man whose fame is so complete and whose character is so assured that his compeers are not afraid to plant his monumental likeness on the earth's green wall, and place the laurel upon his living brow, which shall be green for evermore. (Cheers.)

Before entering upon the special subject assigned me, you will bear with me while I make one or two necessary statements.

It is a duty I owe to truth and to myself that I now state, and which I do with much pleasure, not wholly free from envy, that the origin of the movement which culminated to-day is due to another and not to me. The first suggestion of a testimonial to Professor Morse on behalf of the telegraphic craft came from Mr. R. B. Hoover, of Alleghany City, Pa., who now sits beside me, and his name must forever be connected with to-day's work. My part has been to give his desire direction and nurse it to success. And this has been comparatively an easy task. The proposition at once struck a chord in your hearts and mine, which, like unused harps, seemed only waiting for the players' touch. And when I suggested to you a statue as the only fit method of expressing our affection, it did seem as if the wires of the whole continent had become a single harp resonant with a music which still sounds out to-night with plenitude of song.

I hold in my hand a paper which I regard as one of the most wonderful of modern times. There, sir, is the record of a subscription, wholly spontaneous, covering sixty feet of solid nonpareil, and which is not yet stopped. It bears the name of almost every messenger, operator, and telegraphic officer on the continent. The British Provinces have vied with the United States in the heartiness of this tribute. It is a splendid record of love, which speaks with silent but most potential eloquence. As I look upon it to-night, and then on the fair host before me, the sentiment of Gen. Dix is strong within me, and I feel like saying "If any man traduce the telegraphic craft of the American continent, shoot him on the spot." (Great Applause.)

It is proper that I now say

1. I have seen no statue which reflects greater credit on the young artist who executed it. There he sits, with his curly hair and cheerful face, in yonder box. He deserves a round and hearty cheer. I expect to be proud of him in coming years. (Cheers.)

2. I am assured that the statue erected to-day is of purer material and of richer bronze than any yet erected on the continent. It has been moulded in 100 days. To this we are indebted to the honor and earnestness of Mr. Power, of the New York National Fine Art Foundry. He too deserves a cheer. (Cheers.)

3. For the beauty of the site on which the statue stands, and for generous sympathy in its erection, you are indebted to the advocacy of Henry Hilton, Esq., Park Commissioner, and to Mr. Crane, the kind-hearted Superintendent of Central Park.

4. The statue is paid for. Not a cent remains upon it unpaid. (Cheers.) It was paid wholly by you. The masonry and contingent expenses was the gift largely of citizens of New York around me, on whose intelligent generosity proper enterprize never looked in vain. (Applause.)

One word more. There sits the old builder who erected the base. As the last block was settling to its place, he took from his pocket his companion testament, wrapped a New York morning paper around it and thrust it in. As the granite rested down to its place, it enclosed forever that which makes the humblest life monumental, and which Professor Morse will regard as no mean part of the base on which his effigy now rests. (Loud Cheers.)

And now let me perform my duty to the "Ladies of the Telegraph."

1. I claim that Professor Morse, though not a woman, has much of the womanly element in his nature. In this he resembles all truly great men. They carry the soft touch of the mother's hand upon them. Their minds are so formed that they clutch at some darling thought, travail with it to the birth, and nurse it to fruition. So with the Telegraph. It was the child of poverty and tears and suffering. But when born it was of full growth. There it stands, complete as at the first. In Mr. Morse's character and temperament, also, if I may be allowed to say so in his presence, there is a purity and delicacy which justify me in my claim. I know no higher praise, than to say of any man that he carries his manhood with womanly grace.

In this connection I take the liberty of reading a letter, which the intimacy of my relations with Professor Morse permitted me to see, and which I used the freedom to retain. It is a proper part of this occasion :

9 Delahay Street,
Great George Street, S. W.,
London, 10th May, 1871.

My Dear Sir : I read with real gratification that a statue is about to be erected in New York, which, whilst it will perpetuate a faithful likeness of yourself, will be a monument of the great things which you, at the head of American telegraph engineers, have done for the science. Such a memorial will be of world-wide interest, for you belong, not to America alone, but to the world. While congratulating you on this mark of well-deserved respect and esteem on the part of American telegraphists, and regretting that it was not made more *international* allow me to say that there are two memorials of you which will be of equal permanence. The one is in the hearts of those who know you personally, the other is in your well-known electro-magnetic telegraph, which will last as long as telegraphy itself lasts.

Believe me, very truly yours,

(Signed) Robert Sabine.

Prof. S. F. Morse.

2. I claim that the Telegraph itself possesses the characteristics of woman. And I do her no dishonor when I place her with the Telegraph in a most wonderful felicity of speech. (Laughter.)I will not be so ungallant as to insist on any resemblance in its

length. (Renewed Laughter.) Yet is it true of both, that there is no speech nor language where their voice is not heard. (Laughter and Cheers.)

The Telegraph is like woman, also, because along its slender wires passes the soft, warm current that keeps the world intact. What a miserable world would this be without woman and without wires!

Strange as it may seem, I was once mistaken for a poet, and asked to write a poem for a social union, whose membership was wholly of men. The incongruity made me serious, and thus I began:

I have often thought of Adam—lonely master of the world—
With his bare skin trousers dirty, and his unkempt hair uncurled,
And often wondered what our fate, had it been in the plan
That Eve should not have been woman, *but only another man!*
(Explosive Laughter and Cheers.)
'Tis a dismal contemplation, yet seems very clear to see,
That you could not have been you, and I could not have been me! (Renewed Laughter.)

No, sir. We need woman. We need our mothers and sisters and wives and daughters to keep us pure, and sweeten and ennoble our lives. How many a strong man, when sorrow weaves its dark cloud above him and the big tears gather in his eye, walks out into the dark night, and, beneath the peace of the stars, looks back on childhood's years, when all was radiance and joy. In that quiet hour you may hear him say:

My mother! Manhood's anxious brow
And sterner cares have long been mine;
Yet turn I to thee fondly now,
As when upon thy bosom's shrine
My infant fears were gently hushed to rest,
And thy soft murmured prayers my slumbers blest.

It seems forcing illustration to compare so sacred a relation with the telegraph, yet had that slender thread which bound the new world to the old during these last winter months broke, there would have been such a grief that the basin of the Atlantic would have been needed to have held the world's tears. (Cheers.)

3. I claim that the Telegraph is essentially woman's friend. It unites earth's homes. It keeps the wandering child within call of the mother's voice. When joy or grief comes to any household, the parted ones can, by its mysterious bonds, laugh or weep together.

There seems to have been something of a feeling of this recognition of what the telegraph was to be to woman, when Miss Ellsworth, as you have already heard the poet say, ran to tell the news of the Congressional aid which built the first line. Still more seemed it prophetic instinct when she claimed to send the first message. And now look on these bright faces before me, and tell me what the telegraph has done for them! Are you not proud, Professor Morse, that your family are not all boys? (Cheers.) It is not my business here to speak of woman's rights, but here is a sphere pre-eminently hers. In its nature it benefits *her*. In her nature she becomes and adorns *it*. Take care, President Orton! Some time you may have to sleep—like Stanton—in the War Office, to keep a woman from taking the Presidential chair. (Cheers.)

I feel proud to-night that I appointed the first woman who ever performed telegraphic duty on the American continent. I feel very glad also that the last dollar received for this day's ovation was given from the first month's salary of a noble-hearted girl! (Cheers.)

But I must cease. I have but one word more. Professor Morse, I am supposed to-night to represent woman. Now, my venerable friend, imagine me, for once, sweet of lip and bright of eye as ever flashed from beneath a curl or broke a heart. And let me give you, right in this presence, what none but woman can give, and which I give on her behalf, that symbol of love, that token of affection which is the most eloquent and purest of all earth's sounds—a kiss. (Uproarious Laughter and Cheers, which lasted for some time.) Ladies! you may pay me what I have now given for you at your leisure, and I will acknowledge all in the Journal of the Telegraph. (Cheers and Great Laughter.)

THE SONG.

One of the most charming features of the evening was the singing of Miss Antoinette Sterling, who sang the beautiful, never fading ballad of "Auld Lang Syne." It was rendered with most felicitous pathos, expression and power, and added very largely to the delight of the occasion. But for the lateness of the hour it would have been repeated. As it was, Miss Sterling had to return to the platform in response to loud plaudits which rung out from the delighted audience, and which she gracefully acknowledged.

GOVERNOR HOFFMAN having been called from the city, Chief Judge Charles P. Daly, who had kindly consented to take his place, introduced Prof. Morse in the following appropriate address:

ADDRESS OF HON. CHARLES P. DALY.

So far, ladies and gentlemen, from complaining, like the gentleman who addressed you from Massachusetts, or the eloquent clergyman who was heard later, of the limited time allotted to each speaker, I rather rejoice that the lateness of the hour enables me, at least, to compliment the occasion by compressing what I have to say within the limits of a telegraphic despatch. The oldest, the most widely diffused, and the most venerated of all statues among the Greeks, was the one erected to the god Hermes, the divinity, who, in the ancient mythology, was believed to facilitate human intercourse; whose protection and influence was necessary to successful journeying upon land or sea, and through whose instrumentality those who were widely apart were able to communicate with each other. A square marble pillar simply, surmounted by a human head, in all the public places and in most of the private dwellings of Athens, symbolized this divinity of an active migrating and commercial people.

The Romans, as you know, changed his name to Mercury, as he was the patron of merchants; and, with wings upon his cap and his feet, they represented him as the messenger of the gods—the great telegraphic operator of antiquity—the William Orton of Olympus. (Laughter.)

If we should, therefore, ladies and gentlemen, be told that we have, for the first time in this republican country, raised a statue to a living man, we may answer that we have only continued an ancient divinity, by preserving and perpetuating in the Central Park the form of our modern Hermes. (Cheers.)

The direction of his mind towards an invention affecting every part of the globe, came to Professor Morse from a paternal source, for *his* father was the father of American geography. His distinguished parent was the author, in 1784, of the first geography written and published upon the continent of America, to improve which he afterward made personal journeys over our then imperfectly developed country, that he might describe it more accurately in connection with the other parts of the earth, which resulted in a more enlarged work, of such surpassing excellence, that it was not only published in England, a rare honor in that day for an American book, but was also translated into the languages of France and Germany. We have therefore, ladies and gentlemen, the spectacle of the father devoting his life to making mankind more accurately acquainted with the globe which they inhabit, and the son following it up by an invention to facilitate the intercourse of mankind over every part of it. (Applause.)

If I am right in my recollection, the name of Morse is derived from an old Celtic word signifying *hero*, and certainly none to whom the term is applied can be more deserving of a statue than one who lay a world under obligation by some great discovery or invention. Professor Morse is one of that illustrious body of human benefactors, and we do ourselves honor, and not him, by the memorial unveiled today; because we show that in his own age, during his life and in his own country, the greatness of his achievement was appreciated. So far as he is concerned we can do him no honor, for his name is embalmed in his invention, and will be as perpetual as civilization itself. (Cheers.)

I said, ladies and gentlemen, that I would make a telegraphic speech, but find that I am exceeding the boundary. So I will come at once to the pith and point of my address by saying that I introduce, with great pleasure, to this immense audience, Professor Morse.

As the venerable Professor arose to respond, the whole vast audience broke into a wild warm cheer of salutation. It was a moment of intense interest. The venerable presence, his quiet and refined bearing, the feeling of relationship between himself and the audience, the thought that this was to be the parting word, all rendered the scene solemn and stirring.

PROFESSOR MORSE'S ADDRESS.

Friends and Children of the Telegraph: When I was solicited to be present this evening, in compliance with the wishes of those who, with such zeal and success, responded to the suggestion of one of your number that a commemorative statue should be erected in our unrivalled Park, and which has this day been placed in position and unveiled, I hesitated to comply, not that I did not feel a wish in person to return to you my heartfelt thanks for this unique proof of your personal regard, but truly from a fear that I could use no terms which would adequately express my appreciation of your kindness.

Whatever I may say must fall far short of expressing the grateful feelings, or conflicting emotions, which agitate me on an occasion so unexampled in the history of inventions. Gladly would I have shrunk from this public demonstration, were it not that my absence to-night, under the circumstances, might be construed into an apathy which I do not feel, and which your overpowering kindness would justly rebuke.

But where shall thanks begin, if, looking through all intervening instrumentalities, the Great Author of the gift of the telegraph to the world be not first of all acknowledged. "Not unto us, not unto us, but unto God be all the glory."

When I consider that He who rules supreme over the ways and destinies of man, often makes use of the feeblest instruments to accomplish His benevolent purposes to man, as if, by grandest contrast, to point the mind with more marked effect to Him as their author, I cheerfully take my place on the lowest seat at His footstool. (Applause.)

It is His pleasure, however, to work by human instrumentality. You have chosen to impersonate, in the statue this day erected, the invention rather than the inventor, and it is of no small significance that in the attitude so well chosen, and so admirably executed by the talented young sculptor whose work presents him so prominently and so favorably before you, he has given permanence to that pregnant and just sentence which was the first public utterance of the telegraph: "What hath God wrought."

Little did that young friend, twenty-seven years ago, (and whose presence here to-night I most cordially greet), in the artless innocence of a devout heart, dream of the far-reaching effect of that first telegram which she indited, upon him who transmitted it. While as if by inspiration she struck the key-note of the invention, placing its real author upon the throne, it at the same time struck a responding chord within this bosom which still vibrates to temper with its ringing note, any proud aspiration of a selfishness that, unchecked, might be disposed to exclaim: "Is not this great Babylon which I have built, by the might of my power?" Yes, little did that young friend dream that she had thus furnished me a substantial retreat from the conflicting elements, which public and private praise at home, and the gratulations of foreign nations, stir into activity in the human heart unless is kept in just prominence the Supreme Author of the gift.

You have chosen to impersonate in my humble effigy, an invention which, cradled upon the ocean, had its birth in an American ship. It was nursed and cherished not so much from personal as from patriotic pride. Forecasting its future, even at its birth, my most powerful stimulus to perseverance through all the perils and trials of its early days—and they were neither few nor insignificant—was the thought that it must inevitably be world-wide in its application, and moreover, that it would everywhere be hailed as a grateful American gift to the nations. It is in this aspect of the present occasion that I look upon your proceedings as intended, not so much as homage to an individual as to the invention "whose lines" from America "have gone out through "all the earth, and their words to the end of the "world."

In the carrying out of any plan of improvement, however grand or feasible, no single individual could possibly accomplish it without the aid of others. We are, none of us, so powerful that we can dispense with the assistance, in various departments of the work, of those whose experience and knowledge must supply the needed aid of their expertness. It is not sufficient that a brilliant project be proposed, that its modes of accomplishment are forseen and properly devised; there are, in every part of the enterprise, other minds, and other agencies to be consulted for information and counsel to perfect the whole plan. The Chief Justice, in delivering the decision of the Supreme Court, says, "it can make no difference whether he" (the inventor) "derives his "information from books or from conversation with "men skilled in the science,"—and "the fact that "Morse sought and obtained the necessary information "and counsel from the best sources, and acted "upon it, neither impairs his rights as an inventor "nor detracts from his merits." The inventor must seek and employ the skilled mechanician in his workshop, to put the invention into practical form, and for this purpose some pecuniary means are required, as well as mechanical skill. Both these were at hand. Alfred Vail, of Morristown, New Jersey, with his father and brother, came to the help of the unclothed infant, and with their funds, and mechanical skill, put it into a condition creditably to appear before the Congress of the nation. To these New Jersey friends is due the first important aid in the progress of the invention. Aided, also, by the talent and scientific skill of Prof. Gale, my esteemed colleague in the University, the Telegraph appeared in Washington in 1838, a suppliant for the means to demonstrate its power. To the Hon. F. O. J. Smith, then Chairman of the House Committee of Commerce, belongs the credit of a just appreciation of the new invention, and of a zealous advocacy of an experimental essay and the inditing of an admirably written report in its favor, signed by every member of the Committee. It was, nevertheless, thrown aside among the unfinished business of the session; and now commenced days of trial. Years of delay were yet before it. It was not till 1842 that it was again submitted to Congress. Ferris, and Kennedy, and Winthrop, and Aycrigg, McClay, and Wood, and many others in the House, far-seeing statesmen, rallied to its support, and at length, by a bare majority, the bill that was necessary was carried through the ordinary forms, and sent to the Senate, where it met with no opposition and was passed the last night of the session.

Now commenced a new series of trials, to which it is unnecessary here more than to allude.

To Ezra Cornell, whose noble benefactions to his State and the country have placed his name, by the side of Cooper and Peabody, high on the roll of public benefactors, is due the credit of early and effective aid in the superintendence and erection of the first public line of telegraph ever established.

Notwithstanding the success of the experimental essay, another important step was necessary ere the invention could demonstrate its vast utility. It was not until the skill and experience of the best Postmaster General that had ever held that office, the Hon. Amos Kendall, were brought into requisition, that, amid many discouragements, the various companies were organized, and in the hands of such enterprising men as Sibley, who united the Atlantic and Pacific, and Swain, and Wade, and a host of determined men whose names would read like the pages of a dictionary, this vast country, from the northern boundaries of Canada to the Gulf of Mexico, and from the shores of the Atlantic to the Pacific, were webbed with telegraphic wires. (Applause.)

Another grand stride was yet to be taken ere international communication could be established.

In October, 1842, the first submarine telegraph cable was laid by me in one moonlight night, in the harbor of this city, which proved experimentally the practicability of submarine telegraphy, and from the result of this success I ventured, the year after, in a letter to the Secretary of the Treasury, to predict the certainty of an Atlantic Telegraph. It was then believed to be a visionary dream; and had the individual carrying out of so bold an enterprise depended upon me alone, it might still have been a dream. But at this crisis another mind was touched with the necessary enthusiasm, admirably fitted in every particular, by indomitable energy and perseverence and foresight, as well as financial skill and influence, to undertake the novel attempt. To Cyrus W. Field, more than to any other individual, belongs the honor of carrying to completion this great undertaking. Associating with himself Cooper, and Taylor, and Roberts, and White, and Hunt, and Dudley Field, and others on this side the Atlantic, and, two years later, Peabody, and Brett, and Brooking, and Lamson, and Gurney, and Morgan, and others in Great Britain, making the ocean but an insignificant ferry by his repeated crossings, undaunted by temporary failures and unforeseen accidents, he rested not till Britain and America were united in telegraphic bonds—the Old and the New World in instantaneous communication. (Cheers.)

If modern progress in the arts and sciences have given unprecedented facilities for the diffusion of the Telegraph throughout the world, back of all are the former discoveries and inventions of the scientific minds of Europe and America, Volta, Oersted, Arago, Schweigger, Gauss and Weber, Steinheil, Faraday, Daniell and Grove, and a host of brilliant minds in Europe, with Professors Dana and Henry, in our own country, in the past, and the more modern discoveries and inventions of Thomson, of Whitehouse, of Cooke, of Varley, of Glass, and Canning, and numerous others. These all, in a greater or less degree, contributed to the grand result.

There is not a name I have mentioned, and many whom I have not mentioned, whose career in science or experience in mechanical and engineering and nautical tactics, or in financial practice, might not be the theme of volumes, rather than of brief mention in an ephemeral address.

To-night you have before you a sublime proof of the grand progress of the Telegraph in its march round the globe.

It is but a few days since that our veritable antipodes became telegraphically united to us. We can speak to and receive an answer in a few seconds of time from Hong Kong, in China, where ten o'clock to-night here is ten o'clock in the day there, and it is perhaps a debateable question whether their ten o'clock is ten to-day or ten to-morrow. China and New York are in interlocutory communication. We know the fact, but can imagination realize the fact? But I must not further trespass on your patience at this late hour.

I cannot close without the expression of my cordial thanks to my long-known, long-tried and honored friend Reid, whose unwearied labors early contributed so effectively to the establishment of Telegraph lines, and who in a special manner, as Chairman of your Memorial Fund, has so faithfully and successfully, and admirably carried to completion your flattering design.

To the eminent Governors of this State, and the State of Massachusetts, who have given to this demonstration their honored presence; to my excellent friend the distinguished Orator of the day; to the Mayor and city authorities of New York; to the Park Commissioners; to the Officers and Managers of the various, and even rival Telegraph Companies, who have so cordially united on this occasion; to the numerous citizens, ladies and gentlemen; and, though last, not least, to every one of my large and increasing family of Telegraph children, who have honored me with the proud title of *Father*, I tender my cordial thanks. (Applause.)

At the close of Professor Morse's address, which was listened to throughout with the deepest interest, and was delivered in a clear, steady voice, in which there was no evidence of feebleness or decay, on invitation from Mr. Orton, Rev. Dr. Ormiston uttered the following benedictory prayer in the stead of Rev. Henry Ward Beecher, who had been compelled to leave early in the evening for Brooklyn:

BENEDICTORY PRAYER BY REV. DR. ORMISTON.

O Thou who dwellest in the highest heavens, God over all, blessed forevermore, inhabiting eternity and its praises, infinite in all Thy glorious attributes, fearful in Thy praises, alone doing marvelous things, we, Thy servants here assembled, desire, with all holy ones above and with all saintly souls below, humbly, reverently, and gratefully to worship Thee. Graciously be pleased to accept the tribute of our praise, which we present in the name of our only mediator and intercessor, Christ Jesus. We call upon our souls and all that is within us to bless and magnify Thy name, for all the goodness and the mercy Thou hast caused to pass before us this day; for our being, and all its blessedness; for our homes, and all their happiness—the light of love which illumes them, and the peace and plenty which fill them; for the land wherein we dwell, and all its institutions of civil and religious liberty; for the age in which we live, with its discoveries, inventions, and progress in all that manifests the manifold wisdom of God and advances the best interests of mankind. We bless Thy thrice holy name, who givest us all things richly to enjoy. And specially do we praise Thee for the gift of Thy dear Son, our divine Saviour; for Thy glorious Gospel and its hallowed ordinances; for Thy blessed Word and for Thy holy day. And again would we render Thee devout and hearty thanks for the high gifts with which Thou hast been pleased to endow some of Thy servants, by the exercise of which the divine glory is proclaimed and human happiness increased. We thank Thee for the auspicious occasion of our present meeting, and for the good feeling and brotherly love which has characterized its proceedings and gladdened our hearts. And we desire to commend each other to the grace of God, which is able to build us all up and to give us an inheritance among them who are sanctified.

Almighty God, our Heavenly Father, mercifully dismiss us now with Thy blessing, and carry us to our homes in safety; and when our course on earth is finished, may we each have an abundant entrance administered unto us into Thy kingdom and glory. The good Lord hear our prayer, pardon our sins and accept our services, for Jesus' sake.

The grace of our Lord Jesus Christ, the love of God the Father, and the fellowship of the Holy Spirit be upon us and all God's people evermore. Amen.

When the exercises closed, a large number of persons availed themselves of the opportunity to shake hands with Mr. Morse, and near midnight the Academy doors was closed and the great day ended.

COMMITTEE OF ARRANGEMENTS.

Gen. Marshall Lefferts, Chairman,
John Horn, Jr.,
W. K. Applebaugh,
J. W. Burnham,
W. I Reid.

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J. W. Burnham,
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F. Carter,
P. T. Hauff,
C. J. Ryan.

ACKNOWLEDGMENTS.

The committee of arrangements are under obligatations to Mr. Peter Faye and Mr. J. H. Hunt, of the New York Stock Exchange, for valuable services rendered at the Academy of Music.

To Orange Judd, Esq., and Peter Henderson, Esq., for a large supply of beautiful flowers.

To Messers. Polhemus & Landis for printing without charge, all the tickets used for admission, and the large general card.

To Russell Bros. for printing the programme of the day and evening services, and notes of invitation.

To the Band master and Band of Fort Columbus for the fine music furnished by them.

To the Messrs. Steinway, for the use of a grand piano.

And to Mr. Crane, the kind hearted superintendent of Central Park, and his assistant Mr. J. Jerome, who, by every means in their power, endeavored to render the inaugural ceremonies pleasant and successful.

Finally, we thank every body who, throughout the day or evening, in any way contributed to the pleasure of any one attending the delightful ceremonies.

And we do most devoutly return our thanks grateful and fervent, to Almighty God, who granted us a day beautiful and glorious with sweet fresh air and vivifying sunshine; with a day marred by no accident or coarseness or vulgarity; with a day marked by high moral perception of the filial duty and the grand era which its great ovation illustrated, performed, and recognized. It was a remarkable circumstance that near midnight, as the great audience were leaving the Academy, a

MAGNIFICENT AURORAL DISPLAY

appeared in the sky, as if the elements were in joyous sympathy with the occasion, and lighted their electric fires on that tranquil summer's night to testify their approbation. May the 10th of June, 1871, remain forever a green spot in the memory of us all.

The expenses of the day amounted to $412.24, half of which has been provided.

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MORSE TESTIMONIAL FUND.

The following is the last dollar received as we close our statement of receipts:

Please allow a young operator—a beginner, and poor—to contribute, at this eleventh hour, one dollar from her first month's salary. While studying the science and learning the art she has longed, with longings seemingly never to be fulfilled, and hoped against all hope, that the pleasure of adding her "mite" might be granted her; and now she has the opportunity she will unite with her prayers for long life and much happiness for Professor Morse, the prayer that her meagre offering may not be too late, but that she may be able some time to look upon the noble work and say, "I did what I could for this."

MARY J. CATLIN,
Operator, Lebanon, N. H.

OPINIONS OF THE PRESS.

THE MORSE MONUMENT.

The erection of the statue of Professor MORSE to-day will celebrate one of the most important contributions which America has made to that material progress of mankind which is the distinctive achievement of the century. There is nothing comparable to it in American annals except the application of steam to transit by water. There is, indeed, some feeble claim that FULTON was not the real inventor of the steamboat, as there is that MORSE was not, in a strict sense, the inventor of the method of applying electricity to commemorate which his statue is to-day to be given to the gaze of New York, and to vindicate for many generations his claim to the honors which the kings and peoples of the earth have already agreed to pay him. The dispute about the real origination of the idea which Professor MORSE has realized is indeed an idle one. It only confirms what the annals of all invention prove—that any memorable invention is not the work of any single man, but that, as the proverb truly has it, necessity is its mother, and that the ripening of time brings to birth, sometimes in many heads almost at once, the proper fruits of the time. In no case can the sneer of the satirist about the London monument be applied to this monument of New York, nor can it be said that this statue,

> "reaching to the skies,"
> Like a tall bully lifts its head and lies.

The average American reader of printed matter in America would be puzzled to fix at short notice the credit of the invention of that art of printing which he uses every day, and would hover vaguely between FAUST and GUTTENBERG, while if the question is put by any tourist in Holland to any native of that soil from the Moerdyk to Texel, he would be greeted with the unhesitating and indignant utterance of the unfamiliar name of LAURENS JANSZOON KUSTER. So true is it that mankind, rather than any man or group of men, are entitled to the chief credit for what mankind has done. But FULTON and MORSE nevertheless represent and rightly represent the steamboat and telegraph. It is not the man who thinks out a thing but a man who does it whom his fellows delight to honor. It is not the man who first proved the possibility of a steamboat but the man who first built a steamboat who deserves to be called its inventor. And it is not the man who first proved the possibility of communicating by electricity but the man who first communicated electrically with other men deserves to be called the inventor of the telegraph. And there can be as little doubt that MORSE first applied electricity to human communication as that FULTON first applied steam to human commerce. In the language of the old doggerel, the popular faith will continue to be that although

> "'Twas Franklin's hand that caught the horse,
> 'Twas harnessed by Professor Morse."

The sort of faculty which works out a scientific problem is not the sort of faculty which is needed to apply scientific discovery to the use of man and to produce that fruit which BACON declared to be the end of philosophy, "the glory of the Creator and the relief of man's estate." The whole population will unite to cry hail to-day at the uncovering of the effigy of an American citizen who in his youth won a high place in the annals of art in America, and in his manhood a still higher place in the annals o science in America, and to whom now, in a prosperous and blameless old age, it is granted to receiv the honorable tribute which in cases of like desert with his is commonly deferred until the object of t is beyond its reach.—*N. Y. World.*

THE HONORS TO PROFESSOR MORSE.

It has been well remarked that of all the great inventions of the century that of the telegraph is the greatest, because it is the simplest. It is the nearest approach man has made to the simplicity and majesty of the works of the Deity. It subordinates one of the great forces of nature to the will and uses of man, and enables the insignificant beings, incapable of travelling by their own strength more than forty miles a day, or by any mechanical aid over five hundred miles a day, to instantaneously hold converse while seperated by half the globe's circumference. By the side of the man who taught his fellow men how to make the electric fluid the agent of their immediate communication irrespective of the distance by which they might be seperated from each other, how small seems the claim to public gratitude of the greatest statesman, merchant, or public instructor. What a caricature appears the statue of Vanderbilt at St. John's Park, or that of Lincoln at Prospect Park, compared to that now erected to Professor Morse, in Central Park.

Usually the world realizes its obligations to its truly greatest and most useful men only when the have gone; and atones for neglect of them during life by posthumous honors. But Professor Morse has the rare good fortune not only to see his invention fully availed of on a wider scale and with more important results that in his fondest imaginings he could have hoped for, but to know that his own merits are recognized in proportion as his discovery has been utilized. If the applause of one's fellows is, next to that of one's own conscience, the greatest source of human felicity, Professor Morse must be to-day the happiest of men, for the honors paid to him are as genuine and sincere as they are notably well deserved and universally approved. There is no set-off or drawback in the services that he rendered to his species. Out of the cotton gin came the extension and conservation of slavery, and incidentally a wholesale devastation and slaughter. Most great discoveries carry mischief in their train to adulterate the public benefit they confer. But Morse's contribution to the conveniences and achievements of the age was good unmixed and benefit unadulterated. New York honors herself in honoring her most useful citizen. *Had Central Park been made for no other purpose than to afford fit surroundings for a Morse statue, the price and acknowledgement for the service he rendered to humanity would hardly have been too great.* —*Brooklyn Eagle.*

THE MORSE MONUMENT.

The commemoration exercises of the Morse statue on Saturday afternoon will long be remembered by the multitude that witnessed them. All things conspired to make them imposing and attractive; the beautiful Park clad in its richest verdure of early summer, the lovely weather, the perfect order of the crowd, and the presence of distinguished men, the representatives of commerce, learning, science and art. It could hardly have been called a pageant, but it was something beyond a holiday show or a military parade, and the moral significance of the testimonial expressed itself in the addresses of the speakers, wherein there was not a word of undiscerning eulogy, but only a hearty recognition of exalted merit. To that was said all the nations of the earth will cordially respond; for in the praise that is rendered to the benefactors of mankind there is no envy, and England and Germany will render as warm tributes to Morse as America has rendered to Herschel and Humboldt.—*N. Y. Evening Post.*

THE MORSE MONUMENT.

The venerable gentleman to whom such extraordinary honors were paid in New York on Saturday, can now well offord to say, in a spirit of devout satisfaction, "*Nunc dimitis.*" It is rare in this world, that a benefactor of the race is thus permitted to be the executor of his own peerless fame. The times have changed with the advancing civilization which has come from the genius from such men as Morse. Copernicus and Galileo and Bacon and Fulton, and hundreds of others to whom the world owes so much, were content to die without the sight, and more or less confidently to trust their fame to the gratitude of succeeding generations. Not so with the men who harnessed the lightning and made it the swift messenger of man. Civilization for once outstripped time itself; and having lived to see his wonderful application connecting countries and continents in links of instantaneous intelligence, and to be recognized as the greatest element in the human progress of the world, the great inventor was called upon to receive the rare honor of assisting at the inauguration of his own statue by a greatful people. In the days of the Empire, the ancient Cæsars were raised, while still living, to the honor of deification, and *divus* became at last a term of official recognition. The honors paid to Morse eclipsed the adulations of the Romans. He has been made to assist at his own immortalizing.

The addresses on Saturday at the Academy of Music were remarkable productions from remarkable men. The efforts of Bryant and Banks and Gallaher —the latter the talented pastor of one of our own churches—were grandly eloquent and eminently worthy of the occasion and the men who delivered them.—*Brooklyn Union.*

AMERICA has at last spoken to the great inventor of the Electric Telegraph, and has told him in emphatic words that he is one of the men, a son of her own, whom it delights her to honor. This more than well earned public recognition was long in coming, but its tardiness was to a great extent compensated by the unanimity, earnestness and enthusiasm with which it was accorded. Professor Morse has long been recognized as the occupant of a prominent niche in the Temple of Fame by our people, but is was not till Saturday last that he received any official notification of it. What Stephenson and Fulton did for transportation, that Morse did for communication. Men can hardly be said to be separated when they can converse at a distance of 3,000 miles; and it is the inventive genius of Morse which enables them to do so. It is no exaggeration to say that the electric telegraph has doubled the commerce of the world; has been the agent whereby treaties have been made, wars avoided, and crime prevented or detected. No greater invention was ever made, except perhaps that of the alphabet and the wheel. To a country like the United States, with its enormous distances, its commercial and general value is incalculable. The dispatches of such corporations as the Atlantic Telegraph Company and the Western Union are to-day governing every market and exchange on this vast continent, and transmitting news to and receiving news from all parts of the civilized world. This is the handiwork of Samuel Finley Breese Morse. Was it surprising that the officers of the Western Union Company should press into the foremost rank of the throngs who did him honor on Saturday last? None can know better than they do the marvels of the invention which he gave to the world. They would place their great founder on the loftiest pedestal. They cried out aloud, "All hail! all honor!" and the world joined heart and soul with them in their acclamation. That cry will re-echo till all time, and the name of Morse will be a household word among generations upon generations yet to come.—*Standard.*

NO MAN among the many benefactors of mankind, since the time of Christ, or even before, has done more for the world than Professor Morse, whose statue was inaugurated on Saturday, and in whose honor the meeting was held in the evening at the Academy of Music. He, even, we suppose, did not foresee all the wonderful results of the magnetic telegraph when he first invented it. Who would have supposed that thousands of miles of ocean would be no obstacle to instantaneous conversation between people of different continents? The progress of telegraph developement is the most astonishing fact in the history of mankind. Well might Mr. Morse say in his speech at the Academy:—"Little did that young friend think twenty-seven years ago (and whose presence here to-night I most cordially greet), in the artless innocence of a devout heart, dream of the far-reaching effect of that first telegram which she indited upon him who transmitted it." Yes, little did any one dream of the wonders it has accomplished. But we shall see greater wonders yet. The telegraph, in the hands of Christian nations, is destined to revolutionize the ideas of the world, to extend civilization and pure religion to the uttermost parts of it, and to bring about the brotherhood of all the families of mankind. Long after the statue erected to Professor Morse shall have crumbled to dust his name will live in history and in the grateful memory of the human race.—*N. Y. Herald.*

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THE WESTERN UNION TELEGRAPH CO.

At the semi-annual session of the board of directors of the Western Union Telegraph Company a report was submitted by the President, of which the following is a synopsis:—

The net profits from July 1, 1869, to July 1, 1870, were $2,227,045. The net profits for the year ending July 1, 1871, [May and June estimated] $2,547,854. For the six months ending July 1, 1871, the net profits were [May and June estimated] $1,216,459. The resources of the treasury have been applied to the purchase of the capital stock, which has been reduced from $41,000,000 to $35,000,000. The bonded debt is about $4,000,000. In 1867 the company had 93,390 miles of wire; in 1870, 119,452 miles; in 1867, 3,061 offices; in 1870, 4,391 offices; in 1870 the company transmitted 9,846,635 messages; the gross receipts in 1867 were $6,643,000; in 1870, $7,321,000; net profits in 1867, 2,477,200; in 1870, $2,852,750; construction of new lines cost in 1867, $415,000; in 1868, 355,000; in 1869, $673,000; in 1870, $400,000. The average tolls on messages in 1867 was 86 cents, and the average expense for each message 56 cents. In 1870 the average of tolls on messages was 71 cents, and the average expense of each message 51 cents.

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We have to record the death of Miss Virginia R. Mansfield, a young lady of much promise, the accomplished and beloved daughter of Ex-Justice Daniel and Hannah Maria Mansfield. Actuated by a desire to make herself useful, she entered the telegraph school of the Cooper Institute, about six months ago, and in little more than four weeks was transferred to the service of the Western Union Telegraph Co., at 145 Broadway, N. Y. But her work soon closed, and she has gone to her rest. She is spoken of in the highest terms for purity and sweetness of character. She died June 2d, aged 18. Buried Sunday, June 4th.

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We have also to record the death of John Calvin Christie, one of the earliest members of the Telegraphers' Life Insurance Association, who died in New York, June 7th, of hemorrhage of the lungs, and was buried June 11th, in the New York Cemetary. The funeral was attended by a large number of his brother operators, by whom he was much respected and beloved. The pall bearers were Gerritt Smith, M. C. Bagley, G. M. Simmons, and R. H. Morris.

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Proprietor.

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Cedar Holders, for Desk	$0 50
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Cedar " " Ex. Plated	0 75
Ebony " " Nickel Plated	1 00
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" " Chased, Ex. Plated	2 00
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No. 6 State Street, N. Y.

OPINIONS.

New York, March 15, 1871.

Telegraph operators especially will find it almost indispensable after once having used it. All who have used it in this business speak very highly of it.

Frank L. Pope,
Associate Editor of the "Telegrapher."

New York, April 21, 1871.

I fully accord in the above opinion of the Self Supplying Pen-Holder, having tested it for some time.

Samuel F. B. Morse.

Testimonial acknowledgements in next issue.

See *Frank Leslie* for the tableau at the Academy of Music.

BORN.

At Elizabeth, N. J., June 11, to Henry W. Pope, a daughter.

Note.—Didn't we told you so.

At Benton, Ala., May 30, to Norton S. Perry, W. U. Telegraph Co., a daughter.

MARRIED.

Riddick—Kelly—At the Methodist P. Church, Enfield, N. C., June 7, by Rev. J. G. Whitfield, Richard E. Riddick, manager W. U. Telegraph office at that place, to Jennie, daughter of the late Col. H. H. Kelly, of Nansemond County, Va.

Sylvester—Hook—In Stockbridge, Wisconsin, on Wednesday, May 24, at the residence of the bride's father, by Rev. Peter Conrad, Mr. W. B. Sylvester, agent L. S. & W. S. R. R. Co. and manager W. U. office, Clinton, Mich., to Miss Emma L. Hook, of Stockbridge, Wis.

EXECUTIVE ORDER NO. 123.

Governmental weather reports and messages will not be checked, and will not be entered either in check report or account current.

A record of the regular weather reports, showing number of words sent upon each circuit, will be forwarded monthly to the Auditor, as per Executive Order No. 122.

All service or office messages in relation to these reports will be booked and checked as free business, and reported, like other free messages on Form 38, under head of "Signal Service." An account of such as are to be charged for will be prepared in the Auditor's office.

This order will take effect from June 1.

William Orton, President.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
June 15, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since June 1, the date of the last tariff order.

Managers are hereby required to enter these changes into their tariff book as soon after the receipt of the Journal *as possible.*

NEW OFFICES.

166 Brunswick, Ga. Heretofore other line office.
243 Bagdad, Ky., re-opened.
* Cobalt, Conn.
59 Claymont, Del.
Church Run, Pa. Tariff same as Titusville, Pa.
37 Darien, Conn.
41 Closter, N. J.
52 Drakesville, N. J.
East Sandy, Pa. Tariff 20 and 2 more than Oil City, Pa.
149 Florence, Ks.
490 Giddings, Texas.
* Garrate, Cal.
59 Gloucester, N. J.
31 Hartford, Vt.
417 Lineville, Iowa.
130 Linconvie, Pa.
290 Lyons, Ind.
221 Lindsay, O.
252 Montpelier, Ind., re-opened.
Milton Farm, Pa. Tariff 20 and 2 more than Oil City, Pa.
* Mammoth Cave, Ky., re-opened.
41 Nannet, N. Y.
63 Nanuka Chunk, N. J.
Picton Landing, N. S. Tariff same as Picton, N. S.
303 Swan Creek, Ill.
417 Seymour, Iowa.
* Sugar Notch, Pa.
394 Summit, Ala.
37 Watertown, Conn.
143 Yellow Sulphur Springs, Va

SUMMER OFFICES RE-OPENED.

143 Alleghany Spgs., Va.
103 Berkeley Spgs., W. Va.
46 Cornwall, N. Y.
46 Cozzens' Hotel, West Point, N. Y.
103 Jordan's W. S. Spgs., Va.
60 Laurel, Del.
169 Little Mountain, O.
67 Mount Pleasant, Del.
143 Montgomery W. S. Spgs., Va.
41 Norwood, N. J.
122 Oakland, Md.
143 Old Sweet Spgs., Va.
* Pequot House, Conn., 25 and 2 N. London, Conn.
* Spencer Spgs., N. Y., 25 and 2 Candor, N. Y.
57 Trenton Falls, N. Y.
63 Wyoming, Del.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Cobalt, Conn.,	30	3	Hartford, Conn.
Garrate, Cal.,	50	5	Sonora, Cal.
Mammoth Cave, Ky.,	50	4	Glasgow Junction, Ky.
Sugar Notch, Pa.,	25	2	Mauch Chunk, Pa.
Baptist Creek, Ont.,	Tariff 30 and 2 via most direct route.		
Belle River, "			
Stony Point, "			
Tecumseh, "			
New Richland, Bonaventure Co, Quebec,			

OFFICES CLOSED.

Brandon, Miss.; Bolton's Depot, Miss.; Burton, Texas; Eaton, Ind.; Golden City, Col., and Galloway, Tenn.

GENERAL INFORMATION.

Business for Yankton and Vermillion, Dac., will hereafter be sent and checked to Sioux City, Iowa, instead of Mo. Valley Junction, as heretofore. Tariff as follows: Yankton, 75 and 6; Vermillion, 50 and 5 from Sioux City.

Business for Church Run, Pa., will be checked to Titusville, Pa.; East Sandy and Milton Farm, Pa., to Oil City, Pa.; Drakesville, N. J., to Dover, N. J.; Nanuka Chunk, N. J., to Delaware, N. J.; and Cozzens' Hotel to West Point, N. Y.

Business for Raritan, N. J., should be sent and checked to Somerville, N. J. Charges for delivery, 50 cents.

Hereafter the tariff to Paxton House and Stand Off City, Pa., will be 10c. more than to Oil City, Pa. Ck. Oil City.

Tariff to Square 149 is ten cents more than Square 476.

The "Tariff for Other Lines" from Oil City, Pa., to Coal City has been reduced to 20 and 2.

Half-rate (Red) business will hereafter be taken for, and received from, all offices of the Montreal Telegraph Co.

In Journal, May 15, list of offices on Penn. R. R. for 93 Newton Hamilton, Pa., read 94 Newton, Hamilton, Pa.; and for 64 Mifflin read 94 Mifflin, Pa.

OFFICES HAVING "SPECIAL SHEET A,"

On and after June 26, 1871 will check Gloucester, N. J., 15 cents more than special rate to Philadelphia, Pa. and Danville, Va., 30 cents more than special rate to Washington, D. C. Present rates not to be increased.

Hereafter the tariff to any point in Nebraska or Kansas; to Pine Bluff and Cheyenne, Wy.; to Hughes, Evans, Greeley, Carr, Central City, Idaho, Georgetown, Kit Carson, First View, Arroya, Hugo, Deer Trail, and Box Elder, Col., on W. Union lines, will not exceed the rate to Denver, Col.

The tariff to Denver, Col., from all offices in Eastern and Central Divisions, will not exceed four dollars.

Tariff to Pueblo, Trinidad, in Col., and Cimarron, Fort Union, Los Vegas and Santa Fe., New Mexico, will not exceed five dollars.

ATLANTIC CABLE BUSINESS.

REDUCTION OF TARIFF.

On and after July 1, 1871, we are notified to collect the following rates of tariff, in gold, to all points in Great Britain, Ireland and France:

	For 10 words or less, counting address, date and signature.	*For each word over 10.*
From New York city, and all points in Nova Scotia, New Brunswick, and New England States	10 00	1 00
From all points in New York (except New York city), New Jersey, Pennsylvania, Delaware, Maryland and District of Columbia	10 30	1 03
From all points in Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Tennessee, Kentucky, Ohio, Indiana, Illinois, Michigan and Wisconsin, from St. Louis, Mo., and from Western Union Co.'s offices in Florida	11 50	1 15
From all points in Texas, Arkansas, Missouri (except St. Louis), Kansas, Nebraska, Iowa, Minnesota, Colorado, Dacotah, Wyoming, New Mexico, Utah, Idaho, Montana, Nevada, California and Arizona	13 00	1 30
From all points in Oregon, Washington Territory and British Columbia	15 00	1 50

Tariff from London to points beyond Great Britain, Ireland and France same as heretofore.

The rule limiting the length of messages to fifty words will be discontinued on and after July 1st.

CABLE TO CHINA.

The line from Singapore to Hong Kong and Shanghai is now complete. Rates as follows:

From London.	*For 20 words, or less.*
To Hong Kong	35.00
To Shanghai	41.25

Half-rates for each additional 10 words, or fraction thereof.

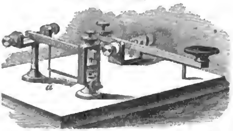
CUBA CABLE BUSINESS.

In messages to be mailed to West Indies, Gulf ports, and South America, the words "Post Havana," or "Post Kingston," must be inserted and counted. Twenty-five cents, gold, must be charged extra for postage.

William Orton, President.

MECHANICAL TELEGRAPH INSTRUMENT,

PATENTED MAY 31st, 1870.



For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

This instrument is an outgrowth of this pressing demand. The Inventor is himself a practical operator, now in active service. Operators and others wishing to teach or learn the Art, will be delighted with this instrument.

It can be placed anywhere, as it does not occupy a space more than six inches square.

Its cost is but $7, and there is no expense whatever to keep it constantly in working order.

We will send a copy of SMITH'S MANUAL, free of charge, with each instrument, to individuals or clubs. The instructions in this Manual are particularly adapted to those who wish to learn by sound.

Special and liberal terms to manufacturers.

Remittances can be made by certified draft on New York, Cleveland, or Pittsburgh, money by express, charges paid, post office order, or registered letter at our risk.

Parties ordering instruments, from points except well-known cities, will please give the name of county and State.

Price, $7. Silver Plated, Extra Finish, $10.

Address, D. W. PUTT & CO.,
Wellsville, O.

D. W. PUTT,
P. BRUNER,
W. G. BROWNSON.

These instruments can also be procured at the same price from L. G. Tillotson & Co., New York; Bliss, Tillotson & Co., Chicago, Ill.; Chas. Williams, Jr., Boston, Mass.; M. A. Buell, Cleveland, O.

JOSEPH MOORE & SON,

(Established 1830).

MANUFACTURERS OF EVERY DESCRIPTION

INSULATED WIRES

FOR TELEGRAPHIC PURPOSES,

535 & 537 CHINA ST., BELOW GREEN ST.,

PHILADELPHIA, PA.

CHARLES WILLIAMS, Jr.

109 Court Street,

BOSTON, MASS.,

MANUFACTURER OF

TELEGRAPH INSTRUMENTS,

BATTERIES,

AND MATERIALS OF ALL KINDS.

CHAS. T. & J. N. CHESTER,

104 CENTRE STREET, N. Y.,

TELEGRAPH ENGINEERS,

And Manufacturers of

INSTRUMENTS, BATTERIES,

AND EVERY DESCRIPTION OF TELEGRAPH SUPPLIES.

Offer the best guaranty of excellence in their profession—in their long established business—in the extent and variety of their manufacturing facilities—in the many improvements introduced by them, now almost universally adopted or imitated—and in the extent of their business, domestic and foreign, enabling them to keep pace with telegraphic progress.

They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer.

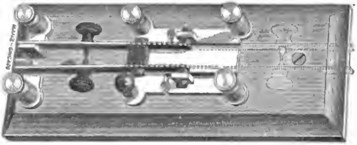
GRAY & BARTON,

479 STATE STREET, CHICAGO, ILL.,

KEEP IN STOCK THE FOLLOWING ARTICLES:

GALVANIZED WIRE,
COMPOUND WIRE,
SCREW GLASS INSULATORS,
(Cauvet's Patent).
BRACKETS, PINS, SPIKES,
BROOKS' INSULATORS,
PLIERS, VISES, PULLEYS, CLIMBERS,
WINDOW TUBES, BATTERY BRUSHES,
SYRINGES, FUNNELS, HYDROMETERS,
ACIDS AND CHEMICALS FOR BATTERIES,

KERITE WIRE,
BRAIDED AND WOUND OFFICE WIRE,
GUTTA PERCHA OFFICE WIRE,
SWITCH CORD,
CALLAUD BATTERY,
DANIELL BATTERY,
GROVE BATTERY,
BUNSEN BATTERY,
LECLANCHE BATTERY,
HILL BATTERY,



REGISTERS,
RELAYS,
BOX RELAYS,
SOUNDING RELAYS,
SOUNDERS,

KEYS,
MEDICAL INSTRUMENTS,
HOTEL ANNUNCIATORS,
PLUG CUT-OUTS,
CUT-OUTS, (new style),

REPEATERS,
SWITCHES,
GALVANOMETERS,
INDUCTION COILS
ALARM BELLS.

☞ Our Morse Instruments are of the Western Union, Ottawa (or Caton) style.

We have ample facilities for the execution of every variety of electrical work.

ATTENTION OPERATORS !

PATENTED.

We would call your attention to our

TELEGRAPH OPERATORS' BADGE PIN.

Having completed our arrangements to manufacture, by putting in new machinery, and with a full force of workmen, we are now ready to supply the GREAT DEMAND for these Badge Pins. They are made of 18k gold, and are perfect fac-simile of the present MORSE, or curved lever keys, and the new style WESTERN UNION straight lever and FANCY BASE KEYS. We are now making two different sizes, one to be three-quarters of an inch long, and the other one inch long. Also, a very small, neat, BADGE KEY PIN for LADY OPERATORS. These are the only badge pins ever got up exclusively for Operators.

We are, also, manufacturing a complete set of RAILROAD BADGE PINS, for CONDUCTORS, BAGGAGE-MASTERS, BRAKEMEN, STATION AGENTS, and others, consisting of Punches, Passenger Cars (Pullman's Palace Pattern), Switch Targets, Coupon Tickets, &c. These Badges are all made of the most approved patterns.

PRICE LIST.

Key Pin, oval base, one inch long	$6 00
Key Pin, oval base, ¾ inch long	5 00
Key Pin, fancy base, one inch long	7 00
Key Pin, fancy base, ¾ inch long	6 00
Key Pin, oval base, (for Lady Operators)	6 00
Key Pin, fancy base, (for Lady Operators)	6 00
Key Pin Charm (for Watch Chain)	$5 00 and 6 00

☞ The above are made with straight or curved Levers. ☜

Conductor Punch Pin	$4 00
Passenger Car Pin (Pullman's Palace Pattern)	6 00
Switch Target Pin	4 00
Coupon Ticket Pin (enamel)	4 00

☞ The above are all made 18k gold (warranted). ☜

Persons ordering Key Pins, be particular in giving style of lever and base wanted.

Any of the above will be forwarded by express, C. O. D., or by mail, registered, by sending amount and twenty-five cents extra to pay postage and registration fee.

Address,

HARVEY & DOW,
ST. JOHNSBURY,
Vermont.

WIRE IN BOND.

For the accommodation of the
SOUTH AMERICAN, CUBAN and MEXICAN TRADE,
we shall hereafter keep a stock of the Celebrated

"JOHNSON" WIRE,

both plain and Galvanized, in Bond, ready for shipment from New York.

PRICES AS FOLLOWS:

No. 9, Plain Annealed	4¾ cts. Gold.
No. 9, Galvanized	5¾ "
No. 8, Plain Annealed	4¾ "
No. 8, Galvanized	5 "

This Brand of Wire is the best in the world, and has been adopted exclusively by the Western Union and many other Telegraph Companies.

We also continue to import this Wire for use in this country, notwithstanding the high rate of duty imposed by Congress in the interest of the monopolists. Any amount of it can be seen at our store at all times. The import duty on wire is now two cents per lb. gold, and 15 per cent. *ad valorem.*

L. G. TILLOTSON & CO.,
No. 8 Dey Street, New York,
Bliss, Tillotson & Co.,
247 So. Water Street, Chicago,

Sole Agents in the United States for "Johnson's" Wire.

Manufacturers of every description of
Telegraph Instruments, Battery and Line Material.

ELECTRIC TELEGRAPH WORKS.

FLEMING, POTTER & CO.,

N.-W. Cor. SECOND & CHESTNUT STS., PHILADELPHIA.

MANUFACTURERS of every description of

TELEGRAPH INSTRUMENTS,

ELECTRICAL APPARATUS, and

RAILWAY SIGNALS, &c.

☞ Inventor's models carefully attended to. ☜

SPECIAL NOTICE.

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK,

AND

BLISS, TILLOTSON & CO.,

247 SOUTH WATER STREET, CHICAGO, ILL.,

Respectfully inform their customers, and all parties purchasing

TELEGRAPH AND ELECTRIC MATERIALS,

that they have been appointed by

SAMUEL C. BISHOP, OF NEW YORK,

General Agents for the sale of any articles manufactured by him

FOR TELEGRAPHIC AND ELECTRICAL USE.

They are now prepared to fill promptly any orders for goods on hand, or to be manufactured, at Mr. BISHOP's prices in New York.

The long experience of Mr. BISHOP in the manufacture of

PURE GUTTA PERCHA GOODS,

and the reputation he has gained and enjoys for the superior quality and perfection of manufacture of his

SUBMARINE TELEGRAPH CABLES

AND

INSULATED WIRES,

of various kinds, insulated with pure Gutta Percha, renders this arrangement a very important one for our numerous patrons throughout the country, and we confidently recommend these goods to their especial notice as being fully equal, if not superior, to any other in use.

The principal articles manufactured and offered for sale are

SUBMARINE TELEGRAPH CABLES,

(Any size required.)

Gutta Percha Covered Telegraph Office Wires, in great variety of size and style.

Subterranean Wires, covered with Gutta Percha and Lead outside, various sizes.

Subterranean Wires with Gutta Percha and braided fibre, and Bishop's Patent Compound outside.

Subterranean Wires, with Fibre and Bishop's Patent Compound outside.

Pole Line Cordage, with Fibre and Bishop's Patent Compound outside.

Bridge's Patent Electric Cordage.

Bridge's Patent Double Covered Cordage.

BISHOP'S PATENT COMPOUND WIRE

for out-door use and office connections.

INSULATED WIRES,

with two Conductors, both plain and with braid outside, and a great variety of other kinds made to order.

Cotton and Silk-Covered Wires, both twist and braided.

This arrangement with Mr. BISHOP, together with our own extensive Manufactory in New York, and our great variety of Telegraph Material in stock, fully establish our claim that our stores are the depots of telegraph supplies in this country.

THE SELF-CLOSING TELEGRAPH KEY.

PATENTED SEPT. 21, 1869.

PRICE $5.

A perfect, simple, homogeneous Self-Closing Key.—JOURNAL OF THE TELEGRAPH.

For full description and testimonial see JOURNAL, Dec. 15, 1870. Liberal terms and arrangements will be made with the trade, telegraph companies and contractors. Sample keys now ready.

JOS. J. B. FREY,
Inventor and Patentee.

A. ILLING,
218 Church Street,
New York City.

CHARLES WILLIAMS, Jr.,

(ESTABLISHED 1856,)

109 Court Street, Boston,

Manufactures and has for sale the various kinds of

OFFICE AND MAGNET WIRES,

Including Cotton Covered, Silk, Gutta Percha, Painted, Fancy, and

DAY'S KERITE COVERED WIRE.

Also, a full assortment of

BATTERIES,

For Telegraphing, Plating, Electrotyping and Experimenting.

SCREW GLASS INSULATORS AND BRACKETS,

Of the size and thread used by the Western Union Telegraph Company.

Having secured an Exclusive Agency for these Insulators, (manufactured under the Cauvet patent,) we are filling orders promptly for large or small quantities, at prices as low as any Insulator can be sold for in the market.

GRAY & BARTON,

479 State St., Chicago.

GALVANOMETER,

AND RESISTANCE COILS,

On the principle of the

WHEATSTONE BALANCE.

We have supplied a large number of these

INDISPENSABLE HELPS

Towards securing a good working telegraph line to various superintendents and operators, and can supply orders on short notice, as we keep the instruments in stock already finished.

Our Galvanometer is designed expressly for Telegraph Service—is light, portable, and easily handled.

GRAY & BARTON,

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CHESTER, PARTRICK & CO.

Manufacturers and Dealers in all kinds of

TELEGRAPH INSTRUMENTS AND SUPPLIES,

38 SOUTH FOURTH STREET, PHILADELPHIA,

Now offer for sale, or will manufacture to order,

REGISTERS,
RELAYS,
KEYS,
LIGHTNING ARRESTERS,
SOUNDERS,
SWITCHES

And every variety of instruments now in use. Among the supplies constantly kept on hand, are the following:

Battery Materials of all kinds, Fine Wire, all sizes, Brackets, Insulators, Medical Batteries (induced or direct current), Fire and Burglar Alarms for Banking Houses and Private Residences, as well as for cities and towns; also Contractors for the Construction, Reconstruction and Repair of Telegraph Lines throughout the United States.

All the Standard Works on Telegraphy furnished at the lowest prices, among which is the latest work of

MODERN PRACTICE OF THE ELECTRIC TELEGRAPH,

By Frank L. Pope.

Also, Electro-Platers' Batteries and Materials, Blasting Apparatus, Cartridges and Patent Portable Machinery for the manufacture of Nitro Glycerine.

All orders executed with promptness, and satisfaction guaranteed in the quality of articles supplied.

AMERICAN FIRE ALARM
AND
POLICE TELEGRAPH.

GAMEWELL & CO., PROPRIETORS,

NO. 104 CENTRE STREET, NEW YORK.

This system of Fire Alarm Telegraph, with a central office, or upon the

AUTOMATIC PLAN,

is now in operation in the following cities, to which reference is made for evidence of its great SUPERIORITY AND VALUE, and UNIFORM reliability:

BOSTON,
CHICAGO,
PHILADELPHIA,
CINCINNATI,
ST. LOUIS,
BUFFALO,
BALTIMORE,
MOBILE,
NEW ORLEANS,
PITTSBURG,
LOUISVILLE,
ALLEGHANY,
MONTREAL,
QUEBEC
PORTLAND,
ST. JOHN, N. B.,
HARTFORD,
TROY,
NEW HAVEN,
ROCHESTER,
SPRINGFIELD,
TOLEDO,
ALBANY,
COLUMBUS,
LAWRENCE,
MILWAUKEE,
SAN FRANCISCO,
CAMBRIDGE,
WASHINGTON, D. C.

The distinctive features of

THE AMERICAN FIRE ALARM TELEGRAPH

are a Combination of Circuits, the Automatic Signal Boxes, Electro-Mechanical Bell and Gong Strikers.

THE AMERICAN FIRE ALARM AND POLICE TELEGRAPH is covered by some twenty patents. Very early after its introduction into Boston, GAMEWELL & Co. purchased the original patents of FARMER & CHANNING, and during the past fifteen years have spared no expense or pains to improve and perfect this system.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy upon application as above.

L. G. TILLOTSON & CO.

8 Dey Street, New York,

MANUFACTURERS OF

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MATERIALS OF EVERY DESCRIPTION.

General Agents for the

AMERICAN COMPOUND TELEGRAPH WIRE COMPANY.

The Compound Wire has now stood every test to which it can be subjected. Over twelve hundred miles of it are now in operation with the most satisfactory results.

General Agents for S. C. Bishop's

TELEGRAPH CABLES,

GUTTA PERCHA AND OTHER INSULATED WIRES.

General Agents for

PURE NITRIC AND SULPHURIC ACIDS

Manufactured by the Lodi Chemical Works.

Importers of the best manufacture of

ENGLISH GALVANIZED WIRE.

Publishers of Prof. J. E. Smith's

MANUAL OF TELEGRAPHY.

GROVE,
CARBON
HILL'S,
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And every description of

BATTERY ALWAYS ON HAND.

L. G. TILLOTSON & CO.,

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MANUFACTURERS OF

GLASS INSULATORS, ALL PATTERNS,

Zincs, Porous Cups, Platinum, Acids, Quicksilver, Tumblers, Coppers, &c. All of the most approved Pattern and Best Quality.

REGISTER PAPER, MANIFOLD PAPER, MESSAGE PAPER (IN STRIPS).

Printed Message Heads and Envelopes

On hand and furnished to order.

WIRE, GALVANIZED AND PLAIN,

AT THE

LOWEST MANUFACTURERS' PRICES.

COPPER AND BRASS WIRE

Of any number required.

OFFICE WIRE,

GUTTA PERCHA or COTTON COVERED

AND

MAGNET WIRE.

REGISTERS,
RELAY MAGNETS,
SOUNDERS,
KEYS,
CIRCUIT-CLOSERS,
CUT-OUTS,
SWITCH-BOARDS,
BINDING-SCREWS,
PAPER-REELS,
LIGHTNING-ARRESTERS,
REPAIRERS' TOOLS,
&c., &c., &c., &c.

OF EVERY DESCRIPTION.

CABLES

Of any desired Size and Pattern. American Manufacture.

We shall be happy to answer all enquiries and furnish any required information promptly.

L. G. TILLOTSON & CO.,
11 Dey street, New York

BLISS, TILLOTSON & CO.,

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TELEGRAPH MACHINERY AND SUPPLIES,

GALVANIZED AND PLAIN WIRE,

INSULATORS, AND EVERY DESCRIPTION OF

OFFICE AND BATTERY MATERIAL

ALWAYS ON HAND.

INSTRUMENTS REPAIRED AT SHORT NOTICE.

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GEORGE H. BLISS,
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J. H. KELLY & CO., PROPRIETORS,

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Kerosene Head Lamps,
Sperm Oil Head Lamps,
Lard Oil Head Lamps,

For Strength, Beauty of Finish, Lustre of Reflector, and power to throw light a great distance, the Lamps of our manufacture stand unrivaled. Testimonials from prominent Railroad Officers all unite in pronouncing our Patent Head Lamp

THE BEST BURNING LIGHT EVER SEEN.

CONDUCTOR LAMPS.

Best Conductor Lamp, with reflector (Nickel, Plated)....	$20 00
Best Conductor Lamp, German Silver, with Reflector.....	10 00
Best Conductor Lamp, of Brass, with Reflector...........	8 00
Best Conductor Lamp, of German Silver, without Reflector,	8 00
Best Conductor Lamp, of Brass, without Reflector.......	6 00
No. 3 Planished Tin and Brass Lamp, Flange Top........	3 00
No. 6 Egg, Fancy, Pennsylvania R. R. Style..............	3 00
No. 4 American Merchants' Union Express Co. Style.....	3 00
No. 4 Flange Top, New York Central R. R. Style.........	2 50

ENGRAVING NAMES AND WREATHES INCLUDED IN THE ABOVE PRICES.

Boxes for Single Lamps, 25 cts. each. Money to be returned free.

GERMAN SILVER AND BRASS FIRE DEPARTMENT LAMPS.

Firemen's Trumpets of all Styles and Sizes, Made to Order.

Railroad Hand Lanterns of all Colors, &c., &c.

Initials of Roads and Names marked on Glass.

☞ All Orders Promptly Filled. ☜

THE BISHOP GUTTA PERCHA WORKS,

422, 424, 426 East 25th St., N. Y.,

SAMUEL C. BISHOP,

PROPRIETOR,

ONLY AMERICAN MANUFACTURER

OF

PURE GUTTA PERCHA GOODS

IN THE

UNITED STATES.

Have on hand and made to order

SUBMARINE TELEGRAPH CABLES,

INSULATED WIRES, *for*

TELEGRAPH AND ELECTRIC USE, and for

BLASTING AND MINING PURPOSES,

in every variety desired.

As an Insulation for Telegraph Cables and Electric Conductors GUTTA PERCHA has been universally adopted by all scientific and practical Electricians and Manufacturers of Telegraph Cables and Wires in this country and Europe, and has sustained, with increasing confidence in its superiority, the practical test of over twenty years' general use.

The PROPRIETOR *would say to all parties desiring*

SUBMARINE TELEGRAPH CABLES,

that he will guarantee to make and deliver at his Factory any Style of Cable, Insulated with Gutta Percha, as low as they can IMPORT *Cable of the same style and quality.*

ORDERS RECEIVED AT THE FACTORY.

Messrs. L. G. TILLOTSON & CO.,
8 DEY STREET, NEW YORK,
AND
BLISS, TILLOTSON & CO.
247 So. Water St., Chicago, Ill.,

have been appointed by me GENERAL AGENTS for the sale of any Telegraph Cable or Wire manufactured at the Works in New York, at Factory Prices, delivered in New York.

JOHN THORNLEY, 503 Chestnut St., Philadelphia, has been appointed Agent for the sale of any and all goods manufactured by me, at Factory Prices, delivered in New York.

Any goods of my manufacture (except *Telegraph Goods*), are for sale in New York, by

H. G. NORTON & CO., 26 Park Place,
RUBBER CLOTHING CO., 347 Broadway
D. HODGMAN, 27 Maiden Lane.

SAMUEL C. BISHOP
OFFICE AT FACTORY.

POLHEMUS & LANDON, Printers and Stationers, 102 Nassau Street.

JOURNAL OF THE TELEGRAPH.

VOL. IV. NO. 15. NEW YORK, JULY 1, 1871. WHOLE NO. 88.

OPINIONS OF THE PRESS.

The honor of a statue to Professor Morse would have been bald indeed had it not expressed the sentiment of the great public in which he is known as a man and citizen. In our last issue we gave some of the evidence of this sentiment by extracts from our leading journals. We deem our duty unfinished until these are supplemented by others. Never was an act so generously sustained by an enlightened press. The following were excluded from our last issue for want of room :

From the New Orleans Picayune.

Our despatches give an account of the unveiling of the statue of Prof. S. F. B. Morse, and of the interesting ceremonies in which, on the 10th inst., New York, and the telegraphic fraternity at large, did honor to the venerable originator of the electric telegraph. It is seldom that the world thus celebrates the fame of its living benefactors, and it might be said with truth that no one of these was ever permitted to look with his mortal eyes upon such results of his efforts as Prof. Morse has seen. Carlyle's epitome of success—Sir Christopher Wren surveying the finished temple of St. Paul in London—becomes a poor metaphor indeed to represent the triumph of Morse and the pinnacle of fame from which he can look down upon its far extended effects. Prof Morse has been honored by almost all civilized countries on the face of the globe. He has received honorary decorations from the sultan of Turkey, gold medals from the king of Prussia and Wurtemburg, and the emperor of Austria. Napoleon bestowed upon him the cross of the legion of honor, the king of Denmark the cross of a knight of the Danneborg, and the queen of Spain the cross of knight commander of the order of Isabella the Catholic. At the instance of Napoleon, the representatives of ten states—namely, France, Russia, Sweden, Belgium, Holland, Austria, Sardinia, Tuscany, the Holy See, and Turkey—met in Paris and presented him with 400,000 francs, as an honorary and personal reward for his useful labors. Professor Morse has also been banqueted in many of the principle cities of Europe, and the principal colleges in the Old World, as well as the New, have conferred upon him honorary degrees.

Well does the veteran deserve it all. Of such are humanity's true heroes and benefactors!

THE MESSAGE.

We reached the scene of the interesting spectacle shortly before 8 o'clock, while the gentle tapping over all the wires indicated the preparations for the forming of the great circuit. San Antonio impatiently asked the time. Louisville intimated that something must be wrong. Then came some impertinent remark from South Carolina. The various instruments for a few seconds broke out into a Babelish gargon, and then one by one they hushed their jarring talk. There was perhaps, a minute of perfect stillness, then a premonitory stir. An operator rushed to one of the departments and quickly changed his place to one opposite. The regular tac, tac, attracted general attention, and the throng circled around him. Every eye was fixed on the hand hurriedly driving the stencil over the paper—tac, tac, tac.

THE MESSAGE.

Greeting and thanks to the telegraph fraternity throughout the world. "Glory to God in the Highest, on earth peace, and good will to men."

There were a few fainter sounds. Some one remarked, "Pretty scattering ;" another said, "A little light," and then the hand wrote—

S. F. B. MORSE.

Just at that moment some irreverent wretch from Georgia exclaimed, in incomprehensible language, "Bully for the old man." All of course laughed, and the enthusiastic exclamation was repeated, though in somewhat clearer and more elegant diction.

From the New York Evening Post.

Four weeks have not yet elapsed since the moribund Commune of Paris assembled, with flourish of trumpet and peal of cannon, to tear down a statue in one of the proudest places of that city. To-day our fellow citizens assemble, in peaceful guise and with becoming homage, to erect a statue which shall stand, we hope, for ages, as a conspicuous ornament in our finest pleasure ground.

It has been a pleasant thought to many that the blameless and beneficent life of Professor Morse has proved an exception to the melancholy rule of the indifference of contemporaries to the world's greatest benefactors. The sad *sic vos non vobis* of the Latin poet has happily no application to him. He may not, indeed have reaped the substantial fruits of his great invention in collossal wealth, and to have gained a thousandth per cent. of the millions of money he has saved to the great commercial nations of the earth would have made him one of the richest of living men. But he has lived to see his name mentioned with honor wherever civilization has been carried, and to feel the thrill of gratitude that comes along his wire upon such occasions as the present, from the most distant continents of the globe.

Carlyle thought that the finest example of success in history was offered by Sir Christopher Wren, standing on the loftiest point of his great cathedral, and giving the last touch of completion to the Christian temple of St. Paul's. But Professor Morse to-day will enjoy a yet richer triumph when Europe, Asia and Africa shall greet instantaneously the unveiled statue in Central Park. It has been only a few days since the Cable has been laid in the Indian Ocean, and the most remote points of the great East have been placed in immediate communication with Europe and America. This is, indeed, the full fruition of his labors, and the statue rises opportunely by an accidental concidence in the month of an event so auspicious

From the N. Y. Independent.

It is only because the inventor of the magnetic telegraph has lived beyond the ordinary age of man that he has seen the honor given to himself that is generally paid only after a great man's death. It was fitting that his statue should last Saturday be erected in Central Park. His fame is achieved, and there is no chance that he can undo it. Samuel F B. Morse is one of the few great benefactors of the race, and his monument encircles the earth in ten thousand lines of wire and strands of cable. The exercises at the Central Park in the afternoon, and at the Academy of Music in the evening, were of thrilling interest. Mr. W. C. Bryant, Gen. Banks, Rev. H. M. Gallaher, and others, were exceedingly felicitous in their addresses ; and when Mr. Morse sat down to the keys of the first instrument used on the first line in the world, and signed his name to the message, sent to every quarter of the globe, "Glory to God in the Highest, on earth peace, good will to men," the scene was sublime, and the grand audience felt its power, and burst out in enthusiastic though it seemed reverent applause. Fit sequel was this to the first message sent from Washington to Baltimore—"What hath God wrought !" Mr. Morse's own address, recounting something of the history of the invention, was of great interest. Our readers may not generally know that the father of the telegraph was once a professional painter, and was also father of the National Academy of Design. Thus in this better age of the world do utility and beauty join hand to hand.

From the Home Journal.

The invention of the magnetic telegraph, which justly ranks among the noblest benefactions to the race that have been accomplished in modern times, was fittingly commemorated on the 10th instant by the unveiling of the Morse statue in the Central Park, and by other appropriate ceremonies. If ever the rule to erect no statues in our public grounds to the living should be suspended, the present case is clearly one for such indulgence. We congratulate the venerable inventor and artist on the enjoyment in his lifetime of so clear a recognition of his triumphs by the world, a stroke of good fortune which has fallen to the lot of very few of his illustrious predecessors and compeers. The statue is in bronze, executed from a model by Byron Pickett, the sculptor, and as a work of art is highly creditable to his talent, and will add much to his reputation.

From the Nation.

The statue to Professor Morse, erected in the Central Park, was unveiled on the 10th instant, to the accompaniment of addresses from Gov. Hoffman and Mr. Bryant. In the evening there were other exercises at the Academy of Music, which included speeches from Mr. Wm. Orton, General Banks, Dr. Samson, and a very interesting one from Professor Morse himself ; but, it is permissible to say, the ceremonies would have been more effective if Mr. Bryant and Professor Morse had done all the speaking.

There is a general objection to the erection of statues to living men, and it is founded on the principle that a man's own generation is hardly ever competent to estimate him properly. Professor Morse, however, enjoys the unheard-of distinction of having achieved something which has, in his own lifetime, effected a greater change in the conditions of human existence than the work of any one man has ever done. He has revolutionized commerce and war, and, we might almost add, literature and society; and there is hardly any honor which might not be paid to him without running the risk of establishing a dangerous precedent.

From the Methodist.

The ceremonies of the unveiling of the Morse statue, and the gratulatory meeting at the Academy of Music, were a befitting tribute to the great inventor. No living man has contributed more than he to the progress of the human race. We think this can be soberly said. There is hardly a general interest of humanity that is not affected by the telegraph. It is binding the world in ties of intimacy, and facilitating all the intercourse of commerce, diplomacy, science, and philanthropy.

New ideas, which heretofore might have lingered and struggled for years in confined localities, are now caught up and sent flying over all civilized lands. Journalism has been immensely enlarged and revolutionized in some of its most important phases. International difficulties are averted by the speed of international communication and explanation. Not only in the great business of the world, its commerce and its diplomacy, but also in private and social life, the invention has become an immeasurable blessing. The safety of the absent and perilled can be whispered from the ends of the earth into the anxious home. The exaggerations of floating news, once the source of incalculable losses and suffering, can be almost instantly rectified. The thoughts and sentiments of all civilized nations are receiving a daily increasing stimulus from the electrical touch of these potent wires. And yet the invention seems to most of us as a thing of but yesterday. What may not be its results by the end of our century! It is fitting that the inventor should be commemorated as a benefactor of the whole human race.

From the Jewish Messenger.

The erection of a statue to Professor Morse, is something unprecedented in the annals of our country, and a compliment rarely paid to any living man. It is fitting that to the inventor of the telegraph extraordinary honors be paid, and it is the peculiar happiness of Morse that he has lived to a good old age, and has enjoyed a triumph often denied to the highest genius and perseverance.

The ceremonies were in excellent taste. The statue, which is a fine likeness and a successful work of art, adorns the Central Park near the 72d street entrance. The "unveiling" took place at four o'clock, in the presence of an audience composed largely of ladies, and in which our best citizens were fully represented. Appropriate addresses were made by Governor Hoffman, Wm. C. Bryant, and Mayor Hall. In the evening, the Academy was the scene of a perfect ovation, fittingly crowned with the plaudits as the veteran transmitted a message of farewell to the telegraph operators throughout the country.

May Professor Morse be spared yet many years, to witness the consummation of his fondest hopes!

From the Scientific American.

We do not believe there was a single right feeling individual in the entire civilized world who did not feel a glow of pleasure when it was announced that the telegraph operators of this country intended to erect a statue in Central Park, in honor of the venerable Professor Morse.

At the inauguration the utmost enthusiasm prevailed, and a more fitting tribute of a grateful people to a public benefactor never took place in this city.

From the American Artisan.

A tribute, seldom accorded to the living and too often denied to the dead who have made the world better for their having dwelt therein, has been accorded to Prof. Morse, in the erection of a statue. This was unveiled in the Central Park of New York city, on the afternoon of Saturday, June 10, 1871, in the presence of a multitude, and with addresses by the Governor of the State and others. In the evening a large assembly commemorated the occasion with speeches, music and poetry, Prof. Morse being present and responding in appropriate terms to the laudations justly lavished upon him for his agency in developing one of the most wonderful applications of science to the practical purposes of art that the world has witnessed.

It is well indeed that the triumphs of peace should be recognized, as has hitherto only been the case with those of war, and the honors heaped upon the head of the inventor of the telegraph but indicate the reward that mankind is growing constantly more willing to pay for aids derived from inventive genius. The extent to which the human race has been benefitted by the telegraph is shown in the truth that almost the entire world is now embraced within its network of lines. Europe possesses 450,000 miles of wire and 13,000 stations; America, 180,000 miles of wire and 6,000 stations; India, 14,000 miles of wire and 200 stations; Australia, 10,000 miles of wire and 270 stations; and the extension throughout the world is at the rate of 100,000 miles of wire per annum. There are, in addition, 80,000 miles of submarine telegraph wire now in successful operation, extending beneath the Atlantic and German Oceans; the Baltic, North, Mediterranean, Red, Arabian, and China Seas; the Persian Gulf, the Bay of Biscay, the Straits of Gibraltar, and the Gulfs of Mexico and St. Lawrence.

From the N. Y. Mail of June 12.

The Mayor's message occupies so much of our space to-day that we are unable to give a report of the proceedings last Saturday evening at the Academy of Music in honor of Professor Morse. We published on Saturday a pretty full account of the ceremonies attending the unveiling of the Morse statue in Central Park, including full reports of the speeches of Mayor Hall and Mr. Bryant. In all respects the celebration was a great success, and was unmarred by a single unpleasant incident. The skies were auspicious both during the day and evening, and at night nothing occurred to break the working connection of a hundred thousand miles of telegraphic wires which united in communicating the benediction of the "Father of Telegraphy" to his children, and their grateful responses to him.

As the morning papers give full reports of the proceedings at the Academy of Music, we need only add that they were in the highest degree impressive and interesting. The stage was crowded with the most eminent representatives of the different professions and ranks of life, and the main body of the building was filled with intelligent and appreciative spectators and auditors. The hero of this unique and unprecedented demonstration was, of course, the centre of observation, and looked, as he is, a noble specimen of the venerable, yet hale and hearty, patriarchs of our science and art. His address showed that his intellectual powers still remain unimpaired, and that his sympathy with the present and hopes for the future are as ardent and vigorous as those of the youngest men who, on Saturday, paid homage to his genius and character.

With this we must close our inadequate mention of the closing proceedings of a celebration that was without precedent in history, and that will be remembered by the historian long after the statue of Morse has crumbled away and disappeared. For this spontaneous ovation to a world's benefactor was the tribute of the civilized world, and was rendered through the agency provided by the recipient of such unexampled and richly deserved honors.

From the E. Saginaw Gazette.

On Saturday night, the 10th inst., all the wires in the United States were closed to business at precisely half past eight o'clock. Every operator in the country was at his instrument, anxious, expectant, and eager. The aged Professor, sitting on the stage of the Academy of Music in New York, was to send his thanks to the operators throughout the length and breadth of the country, for the monument they had caused to be erected in his honor, and which, with appropriate ceremonies, had that afternoon been unveiled in Central Park. With bated breath they awaited the old man's message, and at last it came,—came flashing over a thousand wires—the last message they will ever get from him:

NEW YORK, June 10, 1871.

TO THE OPERATORS OF THE UNITED STATES:

Greeting and thanks to the Telegraph Fraternity throughout the World! "Glory to God in the highest! Peace on earth, good will to men!!"

S. F. B. MORSE.

Noble words from a noble old man! How they must have thrilled the souls of those who heard them, and with what respect and veneration must each operator, and every man, woman and child in the land hold the dear old man, whose great heart sent this message of love to the disciples of his invention. Bright and enduring on the scroll of fame, in letters of burning fire, his name will glow, when others there will be dimmed by the hand of Time!

The operators have a priceless legacy in the Professor's farewell words. He has lived beyond the allotted three-score years and ten, and though still vigorous, the aged man will soon pass away. Coming from him, as he stands with one foot in the grave, his last words seem

* * "Like the benediction
That follows after prayer!"

impressive and grand, and the proudest message ever received by man.

From the New York Tribune.

Prof. Morse has had a much brighter experience than most of the great inventors. Almost every civilized government on the earth has shown him some signal mark of deference. Ten of the European powers a few years ago, at the invitation of the French Emperor, met in Paris, and voted a joint present of 400,000 francs as a recognition of his services to the world. Not the least gratifying of all the testimonials to his merit is the erection of the statue, as a monument of the gratitude and respect of the craft of which he is the founder. It is a rare honor for any scientific man to be immortalized in bronze during his lifetime, and it was fitting that the telegraphers should have the credit of crowning the long career of Professor Morse with this most remarkable glory.

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Wm. Brittain	"	Scranton, Pa.
M. F. Connor	"	Washington, D. C.
T. H. Huxford	"	"

◆

MORSE TESTIMONIAL FUND.

RECEIPTS SINCE ANNOUNCING THE CLOSING OF THE FUND FOR STATUE CONTRACTS.

CONNECTICUT.

We acknowledge, with great pleasure, the following remittance, which we have been too crowded to insert before:

HARTFORD, Conn., June 1, 1871.

DEAR SIR: We are late, I know, but "better late than never." Trusting that our slight offering will be received in the spirit with which it is given,

Yours, truly, G. B. HUBBELL.

Cheney & Brothers, owners Hartford and South Manchester Telegraph line	$50

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L. M. Snow, manager, Deep River	1
W. W. Hinckley, manager, So. Glastonbury	1
Giles Reynolds, manager, Goodspeed's Landing	1
Total	$89

This remittance came in just in time to meet expenses we had not provided for, and of which a statement is elsewhere given.

Pensacola Telegraph Co	$5
W. M. De Grove, manager, Louisville, Ky	5
J. W. Stover, Boston, Mass.	5
S. M. Monroe, New Canaan, Conn	5
C. Williams, Jr., Boston, Mass	5
Geo. Henderson, Newberne, N. C	2
D. Whitacre, New Lisbon, O	1
F. Summis, So. Norwalk, Conn	1
A. Beamer, manager, Lansing, Mich	2
A. H. Dane, operator, Lansing, Mich	1
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Samuel C. Potts, operator, Whiteville, N. C	1
David J. Harrell, 1st class plug	1

FROM WASHINGTON, D. C.

We acknowledge, with pleasure, the following sums sent us to aid in carrying out the inaugural ceremonies, which are really a part of the Testimonial design:

W. H. Young, Washington, D. C.		$1
J. A. Ryan,	"	1
Cash,	"	1
H. H. Bishop,	"	1
H. R. Miles,	"	1
J. H. Larcombe,	"	1
M. Y. Holley,	"	1
Total		$7

We acknowledge the receipt of ten dollars from J. S. Bedlow, Esq., superintendent of the Third District, E. D., for the like purpose. These remittances confirm the universality of this great filial act of honor.

The following sums have also been received:

Geo. B. Allison, LeRoy, N. Y		$1 00
Henri L. Stuart, N. Y.		1 00
J. H. Capen, Brattleboro', Vt		1 00
C. E. Husted, Rock Island Junc		1 00
W. M. Herron, M. D., Alleghany City		1 00
S. Katz, cattle dealer,	"	1 00
L. Rothschild, cattle dealer,		1 00
W. Bell, Eagle cotton mills		50
Chas. A. Tufts, Dover, N. H		1 00
Mary J. Catlin, operator, Lebanon, N. H		1 00

◆

AN ANECDOTE OF PROF. MORSE.

When the great inventor was in Washington, employing all his energies to obtain an appropriation from the Government to erect a line from Baltimore to Washington, he had his instruments at each end of the Capitol, to demonstrate to the members of Congress the feasibility of the plan. He says: "I talked to them, explained the working of the instrument hour after hour. I gained many adherents; still I saw that many were yet incredulous, and many even scouted at the idea as preposterous, and pronounced my instrument as the toy of a cracked-brained enthusiast. It was toward the close of the session, and there were still about two or three hundred bills yet to be passed before they came to mine. It was late at night, and finally I gave up in absolute despair, and left the Capitol building with a sad heart. I was bankrupt, having expended all that I had on my discovery. I walked down the Capitol steps with exactly fifty cents, all I had in the world and a more disconsolate individual it would have been hard to find. After a wakeful night, I arose in the morning to find my bill passed, and a new era in the history of science commenced."

◆

ON the morning of June 10 we received by express, in a very mutilated and faded condition, a boquet of native flowers from Pratt's Junction, Mass., to be presented to Professor Morse on behalf of Miss Etta Parker of that place. We could not present the flowers, but did the note accompanying them, eliciting the following pleasant acknowledgement:

My dear young friend: Your material boquet did not reach me, but its spiritual fragrance, so concentrated in your kind note, will be perpetuated far beyond the perfume of natural flowers.

Accept, with my thanks, the enclosed photograph and autograph, from

Your friend, S. F. B. MORSE.

MISS ETTA PARKER.

Journal of the Telegraph.

This Journal will be issued on the 1st and 15th of each month commencing with December 1, 1867. It commences with an issue of 4,000. The Western Union Telegraph Company have ordered 3,000 copies for its officers and offices. All its 5,000 stockholders will require it for information of interest to them. So of other telegraph companies and their stockholders.

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NEW YORK, JULY 1, 1871.

JUNE 10th.

From all quarters we hear it said that the inauguration of the Morse statue, and the evening reception to Professor Morse, June 10th, were royally successful. Such is our own impression. To us it was a day of excessive exhaustion and labor, from which we are by no means yet free, but that is lost in the sense of delight that the day was not only unmarred by a single blot, so far as we know, but was to so vast a number of people, a present delight, and a glorious memory.

We published in our last number, not only a complete record of the day, but of the opinions of the press, which we continue in the present issue. Of these we can only cull a few from multitudes. There is no mistaking their tone. Every pen seems dancing to the music of a joyous recognition of the justice and propriety of the work of the great memorial day. And there is one peculiar feature about them of great significance. Few give credit to the profession for the act of honor. It is given to the people. The propriety of the honor could not have a more significant attestation. Every one is willing to assume a personal responsibility for it and share its credit. We would like to see the craft receive its due, and yet there is something compensating in the universal feeling of pride that the thing has been done, and done so well. One of the most felicitous articles which have appeared is the following from the *Hearth and Home*, in connection with a fine likeness of Professor Morse:

> When Noah and his family went forth from the ark, on the subsidence of the waters, there was probably one public rejoicing in which all the inhabitants of the world heartily united. We doubt if there has been a like occurrence during the forty-two hundred years intervening between that day and June 10, 1871, A. D. When one nation celebrates its martial victories, there are always others necessarily having sad hearts. When one people rejoices over a physical achievement, the rejoicing is mainly local, because the benefits received or anticipated belong largely, if not exclusively, to that people; other peoples, if not actually tormented by jealousy, take little interest in the matter. Not so with the celebration of the invention of the telegraph. The tiny wire now stretching from pole to pole—almost from Pole to Pole—both literally and figuratively binds the inhabitants of the whole world together, with a strength greater than that of millions of the most powerful hempen cables; and when the words of praise were spoken to "Father Morse" the other day at the unveiling of his statue in Central Park, and at the Academy of Music in the evening, we doubt if there was one among the hundreds of millions of civilized people who did not or would not respond, "Amen."
>
> It is a fitting thing that we erect a monument to the inventor, and that noble bronze statue of Morse, in the grandest park of our continent, will stand for ages to perpetuate his memory, to keep his form before us, and to stimulate our sons to noble deeds, by showing that the people of a republic are not ungrateful. Men from all ranks—statesmen, divines, and the representatives of commerce, learning, science, and art, came together to take part in the ceremonies of setting up the statue and doing honor to the man. And it was built, not by the rich, or by funds from Government coffers, but by the voluntarily offered contributions of those who are engaged in telegraphic labors, from the youngest messenger boys and girls, who sent a dime each, to the highest officer in the service. The roll of its contributors, presented to Prof. Morse, printed in small type and pasted on a continuous strip, was over ninety feet in length. That roll, and that first instrument, ought to be placed in some public institution, and be guarded with the same care that England guards the first steam engine of Watts, in the Kensington Museum in London.

It is a curious thing that not a paper in New York printed the message of Mr. Morse correctly, but gave it in a most infelicitous state. All begin "Prof. Morse sends greeting to those of the telegrapic fraternity throughout the world." Prof. Morse never used words so unhappily placed. He has a true artist's conception of language. The message was a model of chaste English:

> "Greeting and thanks to the telegraph fraternity throughout the world."

It stumbles one also as to the correctness of history when we find a careful journal like the *Scientific American* saying that Miss Cornwell, the lady who manipulated the message, was the same who sent the first message ever sent in America. And this, too, after the reference, over and over again, in the speeches of the evening, to Miss Ellsworth, the daughter of the then Commissioner of Patents, as the lady who sent a message, now historic in its language, of devout recognition of the telegraph as the gift of God. New Orleans is still worse. It makes the lady Miss Marriott, and the day Prof. Morse's birthday. But even the JOURNAL has its errors. One of the best responses of the evening we have credited to Portsmouth, N. H., instead of Plymouth, Mass., although corrected in part of the issue, and there may be others not yet discovered.

It is our design, as soon as possible, to issue a memorial volume in handsome style, containing a brief biography, a sketch of the invention, and its history, the banquet given in 1868, and the story of June 10, 1871. It may be attempting too much, but such is our present design, and we hope to accomplish it. There seems abundant material for an acceptable memorial volume, if it be found that we have ability to successfully use it.

◆

THE strain upon us, in the labor and anxiety connected with the Inaugural and Reception arrangements has rendered us unfit for our usual duties, of which the JOURNAL bears the indications. A short respite from duty will make all right again.

◆

THE FRANKLIN TELEGRAPH COMPANY.

This Company has published a statement of its business. The following are the figures:

Gross earnings May 1, 1870, to May 1, 1871		$194,240 51
Expenses	$193,571 81	
Interest on debt	9,900 79	203,472 60
Deficit		$9,232 09
Miles of poles	800	
Miles of wire	2,700	
Offices	76	
Operators	100	

The following messages were unaccountably overlooked in the Reception record:

SAN FRANCISCO, July 10, 1871.

To Professor S. F. B. Morse, New York:—The undersigned, for themselves and the telegraphers on the Pacific coast, unite in the general congratulations on this memorable day.

May you live to see your work completed, and when time and space shall have been annihilated, receive in person the first message, the beginning of which, passing through earth and air and sea, shall have circled the globe before the conclusion shall have been written.

JAS. GAMBLE,
General Supt. Pacific Division, W. U. Tel.
GEO. S. LADD,
Asst. General Supt. Pacific Division.

VICTORIA, V. I., June 10, 1871.

To Professor Morse, New York:—On this occasion of honor to the distinguished services which you have rendered to science and mankind, I gladly avail myself of the opportunity afforded to me to render my tribute of respect and admiration.

A. MUSGROVE,
Governor British Columbia.

ELKO, NEV., June 10

Professor S. F. B. Morse, New York:—It is with sincere pleasure I add my congratulations to those of the thousands who this day join in honoring the man to whom the world owes so much.

FRANK BELL,
Resid't Supt. Pacific Division.

PORTLAND, June 10, 1871.

To Professor Samuel F. B. Morse, New York:—Space is annihilated. The far North-west salutes. Franklin discovered for Morse to utilize. Generation after generation will thankfully cherish the memory of their benefactors.

O. P. PLUMMER,
Dist. Supt. Pacific Division.

VICTORIA, V. I., June 10, 1871.

To Professor Morse, New York:—Job, 38th chapter, 35th verse:

Canst thou send lightnings and bid them from afar
To carry back the message, Here we are?
Thus from the lightning cloud Jehovah spake,
And Job thus questioned dared not answer make.
The years by thousands since have rolled their course
Adown the ages, till the days of Morse,
Who hears the echo from the vaulted sky,
And back with lightning answers, Here am I!
To-day o'er earth the scattered nations all,
Obedient to Professor Morse's call,
With lightning harnessed and no longer free,
Flash back the answer, Father, here are we!

F. H. LAMB,
District Supt. Pacific Division.

◆

THE Transandine Telegraph is complete to San Luis, and what is called the Snow Cable across the Cordilleras is being laid. Buenos Ayres expects to be connected with Chili and the Pacific during the present year. An overland line is about to be built from the River Plate to the Rio Grande. A concession to lay a line from Rio Janeiro to Para (near the mouth of the Amazon) has just been granted to Mr. Lamas, of Buenos Ayres.—*Correspondence of the N. Y. Tribune.*

◆

A PROMPT GIRL.

Here are two messages which show a girl of pluck up to advantage:

OIL REGIONS, June 15, 1871.

TO MISS LAURA:

Will you go to the Strawberry Festival with me to-night? Please answer quick. Yours, HERB.

JUNE 15, 1871.

TO HERB:

Yes. Harness up your mules; I am fixing my curles.

LAURA.

◆

AN APPLICANT FOR OFFICE.

29th May, 1871.

DEAR SIR: I read in the paper that you want some mens to learn to operate the thelegram. Well you see my wrigthing and I am good educated. (I am a French Canadien, and I am from Montreal.) And I wish, if you could let me know, how are the conditions ton learn to operate. If you teach for nothing, and if you board too. Please sand me a letter soon as possible, and tel me all about it. If you do it I be verry much oblidge to you.

Who wants him?

PRESENTATION TO COL. HEISS.

Col. W. H. Heiss, the General Superintendent of the International Oceanic Telegraph Company, was presented, on the 1st inst., with a handsome solitaire diamond breast-pin, by the operators of the company.

The presentation was made at Key West, by Messrs Ledwitch, Clark and Maloney, who presented the following

ADDRESS.

Col. Wm. H. Heiss, General Superintendent International Ocean Telegraph Company:

RESPECTED AND DEAR SIR: Desirous of approaching you with the feelings of respect that your kind superintendence of this line has awakened, we, the employees of the International Telegraph Company, have resolved upon presenting you with the accompanying trifle, more as a mark of esteem, than for any intrinsic value that it possesses. Fancying that it would not be ungratifying to you to learn that you have gained the love and esteem of those who are placed under you, we deem that a little present would open the door and permit of our conveying to you such a knowledge.

Trusting, dear sir, that you will long be spared to fill the place that would be strange to us without you, with heartfelt wishes for your health and happiness, we beg that you will accept this *solitaire diamond pin*, with what we feel your heart will more fully value—our best and kindest affection.

Respectfully,

Francis Rovers,
Leonelo DeAzena,
Louis Poey,
Edwardo Garcia,
Charles S. Maloney,
William Ledwitch,
Thomas S. Clarke,
George R. Shultz,
John Witherford,
Charles W. Thompson,
William Dias,
Wm. A. Johnson
Wm. T. Branch,
Wm. H. Pearce,
C. V. Heiss,
Nathan Tucker,
James D. Redding,
Wm. S. Smith,
Thos. E. Gough,
Oscar P. Morris,
Peter Jackson,
Carlos Huntley,
Joseph W. Francis,
John Henderson,
Samuel B. Rawls,
A. L. Canova,
B. C. Edward,
Daniel B. Hamlin,
Daniel J. Crowly,
John F. Crowly,

Col. Heiss returned the following reply:

PHILBRICK'S ROOMS,
KEY WEST, FLA., June 1, 1871.

Gentlemen: It was with feelings of the most pleasant surprise that I received this evening, through the hands of Mr. W. Ledwitch, Clark and Mahoney, your beautiful gift. I shall treasure it, not so much for its intrinsic value as a mark of your esteem, so spontaneously and generously expressed. It gives me great gratification and causes me no little pride to know that I have won the respect and confidence of those of you associated within our profession. I delight to bear testimony to the faithful and cheerful manner in which you have all served the company we represent. I sincerely trust that I shall be long associated with you, and should time or circumstances separate us, I shall always hope and predict for you individually, the most brilliant success in our honored profession. I am gentleman,

Yours truly, W. H. Heiss,
General Superintendent.

◆

C. B., in the Tariff orders, stand for Cape Breton.

◆

Orders for the inaugural number will be filled promptly. Price 5 cents; postage 2 cents extra.

◆

The Great Northern Telegraph Company's cable between Shanghai and Hong Kong was opened April 18, 1871. The three Atlantic cables are all working.

◆

MARRIED.

JACKSON—NEW.—In Richmond, Va., June 6, at the residence of the bride's father, by Rev. J. Q. Garland, Mr. L. S. Jackson, of W. U. Tel. Co., Hartford, Conn., to Miss Mary V. New. No cards.

REDMAN—WOOD.—In Honeoye Falls, N. Y., at the residence of the bride's father, June 13, 1871, by Rev. Mr. Long, of Lima, Mr. George A. Redman, of the W. U. Tel. Co., Rochester, N. Y., to Miss Ida J. Wood.

STAFFORD—EDWARDS.—On Thursday, June 15, 1871, at the residence of the bride's parents, by Rev. Richard R. Williams, assisted by Rev. M. B. Mead, Mr. O. F. Stafford, ticket agent and telegraph operator, N. Y. C. and H. R. R. R. Co., at St. Johnsville, N. Y., to Miss Cornelia, daughter of Henry Edwards, Esq., of Canajoharie, N. Y.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
July 1, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since June 15, the date of the last tariff order.

Managers are hereby required to enter these changes in their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

150 Andover, O.
467 Big Cabin Creek, Ind. Terr.
* Bar Harbor, Mt. Desert, Me
418 Cunningham, Mo.
25 East Killingly, Conn.
456 Fairmount, Ks.
437 Gower, Mo. Re-opened.
140 Hadley, Pa.
46 Highlands House, Garrison's, N. Y., Summer Office,
Knight's Landing, Cal. Tariff same as Silveyville, Cal
37 Lake Mahopac, N. Y. Re-opened.
39 Lake George. Re-opened.
18 Lawton House Stone Bridge, Tiverton, R. I.
151 Leetsville, Pa.
40 Lebanon Spgs. N. Y.
94 Millerstown, Perry Co., Pa
* Miller's Ferry, W. Va.
66 New Philadelphia, Pa.
Ocean House, Newport, R. I. Tariff same as Newport, R. I.
Scribner, Neb. Tariff 70 more than Omaha, Neb.
358 Virginia, Ill.
West Point, Neb. Tariff 75 more than Omaha, Neb
Watch Hill, R. I. Tariff 15 more than Stonington, Conn.
* Yorkville, Ill.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Bar Harbor, Mt. Desert, Me.,	40	2	Ellsworth, Me.
Miller's Ferry, W. Va.	75	3	Catlettsburg, Ky
Yorkville, Ill.	25	2	Aurora, Ill.
Bridgeport, Ont., Elmira, " Mono Mills, " St. Jacobs, "	30	2	Send and check via most direct route.

OFFICES CLOSED.

Bradford, Ind., and Economy, Pa.

GENERAL INFORMATION.

The following change in tariffs between offices of the Southern Division only will take effect July 10:

Where the present rate for 10 words is				45 or 55 cts.,	it will be		60.
"	"	"	"	70 or 80	"	"	75
"	"	"	"	95 or 105	"	"	1 00

The name of the office heretofore known as Caldwell, Lake George, N. Y., Summer office, has been changed to Lake George, N. Y., Summer office. The office at Columbia Hall, Lebanon Springs, N. Y., will also be known as Lebanon Springs, N. Y.

The P. O. address of Millerstown, Lehigh Co., Pa., is Macungie, Lehigh Co., Pa.

Business for Highlands House, Garrison's, N. Y., will be checked to Garrison's, N. Y.

Nanuka Chunk, N. J., new office, in last JOURNAL, should read Manuka Chunk, N. J.

Fort Scott, Ks., is in Square 457; was incorrectly given in Supplement as in 447.

Solon and Morse, Iowa, are in Square 367; heretofore given as in 387.

OFFICES HAVING "SPECIAL SHEET A,"

Will check New Philadelphia, Pa., 15 cents more than special rate to Philadelphia.

WILLIAM ORTON, President

◆

CONDITION OF THE MORSE STATUE FUND.

After announcing the close of the subscription needed for the statue contracts, we received the following:

Subscription acknowledged May 15		$60 75
" " June 1		7 50
" " July 1		156 50
		$224 75
Cost of planting statue, derricks, &c.	$60 08	
Bill for labor on platforms at Park,	40 50	
Half insurance on models	31 26	$131 84
Carried to inaugural expenses		$92 91
Profits on engravings, over cost of plate		127 00
Private subscription		60 00
		$279 91
Total Inaugural and Reception expenses		411 65
Total deficit		$131 74

We will continue to send the engraving of Professor Morse and autograph for $1, until the deficit is cleared off. The lettering will cost $100,00.

EXECUTIVE ORDER NO. 125.

On and after the first day of July, all messages relating to the affairs or business of the United States, except the weather reports and those relating thereto, offered for transmission by any of its civil or military officers or agents, will be received without pre-payment being exacted, and will be forwarded promptly, priority being given them over all other business. The tariff on such messages will be computed as follows: One cent per word for each two hundred and fifty miles or fractional part thereof. All words to be counted, except the date and the place where the message is filed; provided, however, that no message shall be counted as less than twenty-five words. Distances will be computed by the tables of the War Department, which tables will be furnished to all offices where Government messages are regularly filed. Until so furnished, distances can be ascertained by enquiry of the New York or Washington office. All such business will be entered as paid at the office where it originates, and the bills will be presented monthly as heretofore. In cases of inability to collect, a duplicate of the account, and the originals of messages, will be forwarded, with the monthly account current, to the Auditor, credit being taken therefor as cash.

WILLIAM ORTON,
President.

NATIONAL FINE ART FOUNDERY,

218 EAST 28th STREET,

NEW YORK

CASTS,

FIGURES,

BUSTS

and all descriptions of Fine Art Models.

The Statue of

PROFESSOR MORSE

erected at Central Park, was cast at this establishment.

M. J. POWER

PROPRIETOR

THE DARLING SELF-SUPPLYING PEN-HOLDER

CAN BE USED WITH ANY PEN.

WRITES TWO THOUSAND WORDS WITH ONE DIP OF THE PEN IN THE INKSTAND.

These Holders will be sent by mail, post-paid, on receipt of the price, on the following terms:

Cedar Holders, for Desk			$0 50
Ebony " "			0 60
Cedar " "	Ex Plated		0 75
Ebony " "	Nickel Plated		1 00
Pocket Holders, Plain,	" "		1 75
" "	Chased, Ex. Plated		2 00
Six Cedar Desk Holders to one order			2 00

Send Registered Letter or Money Order for safety.

Address, W. A. COOKE, Agent,
No. 6 State Street, N. Y.

OPINIONS.

NEW YORK, March 15, 1871.

Telegraph operators especially will find it almost indispensable after once having used it. All who have used it in this business speak very highly of it.

FRANK L. POPE,
Associate Editor of the "Telegrapher"

NEW YORK, April 21, 1871.

I fully accord in the above opinion of the Self Supplying Pen-Holder, having tested it for some time.

SAMUEL F. B. MORSE.

JUST PUBLISHED.

Complete Works of Shakespeare	$2 00
Byron's Complete Works	2 00
Southey's Complete Works	2 00
Goldsmith's Complete Works	2 00
Pope's Complete Works	2 00
Milton's Complete Works	2 00
Burns' Complete Works	2 00
Scott's Complete Works	2 00
Cowley's Complete Works	2 00
Herbert's Complete Works	2 00
Tennyson's Complete Works	1 50

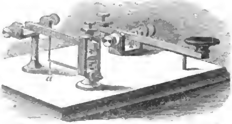
Each bound in extra cloth, gilt edges. Illustrated by Dore Gilbert & Co.

Sent free on receipt of price

O. H. REUBEN & CO.,
62 Nassau street, New York.

MECHANICAL TELEGRAPH INSTRUMENT,

PATENTED MAY 31st, 1870.



For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

This instrument is an outgrowth of this pressing demand. The Inventor is himself a practical operator, now in active service. Operators and others wishing to teach or learn the Art, will be delighted with this instrument.

It can be placed anywhere, as it does not occupy a space more than six inches square.

Its cost is but $7, and there is no expense whatever to keep it constantly in working order.

We will send a copy of SMITH'S MANUAL, free of charge, with each instrument, to individuals or clubs. The instructions in this Manual are particularly adapted to those who wish to learn by sound.

Special and liberal terms to manufacturers.

Remittances can be made by certified draft on New York, Cleveland, or Pittsburgh, money by express, charges paid, post office order, or registered letter at our risk.

Parties ordering instruments, from points except well-known cities, will please give the name of county and State.

Price, $7. Silver Plated, Extra Finish, $10.

Address, D. W. PUTT & CO.,
Wellsville, O.

D. W. PUTT,
P. BRUNER,
W. O. BROWNSON.

These instruments can also be procured at the same price from L. G. Tillotson & Co., New York; Bliss, Tillotson & Co., Chicago, Ill.; Chas. Williams, Jr., Boston, Mass.; M. A. Buell, Cleveland, O.

JOSEPH MOORE & SON,

(Established 1826).

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Offer the best guaranty of excellence in their profession—in their long established business—in the extent and variety of their manufacturing facilities—in the many improvements introduced by them, now almost universally adopted or imitated—and in the extent of their business, domestic and foreign, enabling them to keep pace with telegraphic progress.

They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer.

GRAY & BARTON,

479 STATE STREET, CHICAGO, ILL.,

KEEP IN STOCK THE FOLLOWING ARTICLES:

GALVANIZED WIRE,
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SCREW GLASS INSULATORS,
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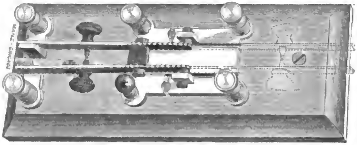
BRACKETS, PINS, SPIKES,
BROOKS' INSULATORS,
PLIERS, VISES, PULLEYS, CLIMBERS,
WINDOW TUBES, BATTERY BRUSHES,
SYRINGES, FUNNELS, HYDROMETERS,
ACIDS AND CHEMICALS FOR BATTERIES,

KERITE WIRE,
BRAIDED AND WOUND OFFICE WIRE,
GUTTA PERCHA OFFICE WIRE,
SWITCH CORD,
CALLAUD BATTERY,
DANIELL BATTERY,
GROVE BATTERY,
BUNSEN BATTERY,
LECLANCHE BATTERY,
HILL BATTERY.



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CUT-OUTS, (new style),

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ALARM BELLS.

☞ Our Morse Instruments are of the Western Union, Ottawa (or Caton) style.

We have ample facilities for the execution of every variety of electrical work.

ATTENTION OPERATORS!

PATENTED.

We would call your attention to our

TELEGRAPH OPERATORS' BADGE PIN.

Having completed our arrangements to manufacture, by putting in new machinery, and with a full force of workmen, we are now ready to supply the GREAT DEMAND for these Badge Pins. They are made of 18k gold, and are perfect fac-simile of the present MORSE, or curved lever keys, and the new style WESTERN UNION straight lever and FANCY BASE KEYS. We are now making two different sizes, one to be three-quarters of an inch long, and the other one inch long. Also, a very small, neat, BADGE KEY PIN for LADY OPERATORS. These are the only badge pins ever got up exclusively for Operators.

We are, also, manufacturing a complete set of RAILROAD BADGE PINS, for CONDUCTORS, BAGGAGE-MASTERS, BRAKEMEN, STATION AGENTS, and others, consisting of Punches, Passenger Cars (Pullman's Palace Pattern), Switch Targets, Coupon Tickets, &c. These Badges are all made of the most approved patterns.

PRICE LIST.

Key Pin, oval base, one inch long	$6 00
Key Pin, oval base, ¾ inch long	5 00
Key Pin, fancy base, one inch long	7 00
Key Pin, fancy base, ¾ inch long	6 00
Key Pin, oval base, (for Lady Operators)	5 00
Key Pin, fancy base, (for Lady Operators)	6 00
Key Pin Charm (for Watch Chain)	$5 00 and 6 00

☞ The above are made with straight or curved Levers. ☜

Conductor Punch Pin	$4 00
Passenger Car Pin (Pullman's Palace Pattern)	6 00
Switch Target Pin	4 00
Coupon Ticket Pin (enamel)	4 00

☞ The above are all made 18k gold (warranted). ☜

Persons ordering Key Pins, be particular in giving style of lever and base wanted.

Any of the above will be forwarded by express, C. O. D., or by mail, registered, by sending amount and twenty-five cents extra to pay postage and registration fee.

Address,

HARVEY & DOW,
ST. JOHNSBURY,
Vermont.

WIRE IN BOND.

For the accommodation of the

SOUTH AMERICAN, CUBAN and MEXICAN TRADE,

we shall hereafter keep a stock of the Celebrated

"JOHNSON" WIRE,

both plain and Galvanized, in Bond, ready for shipment from New York.

PRICES AS FOLLOWS:

No. 9, Plain Annealed	4½ cts. Gold.
No. 9, Galvanized	5½ "
No. 8, Plain Annealed	4¾ "
No. 8, Galvanized	5 "

This Brand of Wire is the best in the world, and has been adopted exclusively by the Western Union and many other Telegraph Companies.

We also continue to import this Wire for use in this country, notwithstanding the high rate of duty imposed by Congress in the interest of the monopolists. Any amount of it can be seen at our store at all times. The import duty on wire is now two cents per lb, gold, and 15 per cent. *ad valorem.*

L. G. TILLOTSON & CO.,
No. 8 Dey Street, New York,
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Sole Agents in the United States for "Johnson's" Wire.

Manufacturers of every description of

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ELECTRIC TELEGRAPH WORKS.

FLEMING, POTTER & CO.,

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MANUFACTURERS of every description of

TELEGRAPH INSTRUMENTS,

ELECTRICAL APPARATUS, and

RAILWAY SIGNALS, &c.

☞ Inventor's models carefully attended to. ☜

SPECIAL NOTICE.

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK,

AND

BLISS, TILLOTSON & CO.,

247 SOUTH WATER STREET, CHICAGO, ILL.,

Respectfully inform their customers, and all parties purchasing

TELEGRAPH AND ELECTRIC MATERIALS,

that they have been appointed by

SAMUEL C. BISHOP, OF NEW YORK,

General Agents for the sale of any articles manufactured by him

FOR TELEGRAPHIC AND ELECTRICAL USE.

They are now prepared to fill promptly any orders for goods on hand, or to be manufactured, at Mr. BISHOP's prices in New York.

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JOURNAL OF THE TELEGRAPH.

VOL. IV. NO. 16. NEW YORK, JULY 15, 1871. WHOLE NO. 89.

A BOLD PROPHECY—PAINE'S ELECTRO-MAGNETIC MOTOR.

Some years since, I made the discovery that when hydrogen gas was treated by simple contact with turpentine, it was rendered highly luminous without any perceptible waste of the turpentine. The gentleman occupying the position of scientific editor in your office, at the time, in noticing my announcement of the discovery, among other complimentary remarks was pleased to say that if he had made such a statement "he would hide his head under a toadstool." So absurd did my statement seem, that, although it was backed by the testimony of some of the best chemists living, your scientist was at a loss for words to express his contempt for myself, and pity for the infatuated persons who endorsed my experiment. And yet, this unbeliever, in less than a month after this adverse criticism, published a full vindication of my discovery, from the pen of George Mathiat, United States Metallurgist, and also gave it his personal endorsement.

In your journal of June 10, you are pleased, in noticing my electro-motor, to introduce again the "toadstool" argument ; and, allow me to assure you, with the same results. If you are acquainted with the gentlemen who are associated with me in this enterprise, you will know that they are men fully competent to judge of the facts in the premises, and men that you or I cannot mislead.

The engine you refer to has been in constant operation for eight months, running nine hours per day, doing a duty of 67,000 foot pounds, at an expense of three ounces zinc per day of nine hours. The engine for four months was open to public inspection, no one being restricted from examining the same. On the formation of the company you allude to, it was deemed necessary to the interests of the same that the engine be withdrawn from general exhibition.

As regards the statements of what is to be done by the 4th July, allow me to remark that I propose to achieve a success even beyond that which you burlesque ; but the question of date is an open one.

And now, having had my fling back, permit me to say that for thirty years I have been a practical experimentalist in electro-dynamics, that I am familiar with the experiments of Grove, Carpenter, Mayer, Faraday, Liebig, and a host of others, relative to the doctrines of correlation and conservation of forces. Therefore, I am no tyro, but the peer of any authority you may quote : and as such I unqualifiedly assert that instead of the miserably small result of 67,000 foot pounds, at a cost of three grains of zinc, we should realize 67,000,000 foot pounds.

The forces developed by the action of a single Bunsen quart cell, if utilized, and converted into power, would drive the largest ship afloat with a velocity only limited by the ship's frame ; and you and I will live to see the day, if our lives are lengthened to the usual term, when this statement will be verified, and that, too, without involving the question of perpetual motion.—*H. M. Payne to the Scientific American.*

Note.—Mr. Payne should confine himself to actual accomplishments. He should leave prophecy to "wild" men, such as the editor of the JOURNAL OF THE TELEGRAPH.

◆

THE SOCIETY OF TELEGRAPH ENGINEERS.

The first meeting inaugurating the birth of a new society, the want of which has been long felt amongst English telegraph engineers and electricians, was held in April last, when 73 members were duly elected, amongst whom are included most of the leading names connected with electrical science.

The Society of Telegraph Engineers is established for the general advancement of electrical and telegraphic science, and more particularly for facilitating the exchange of information and ideas among its members.

The constitution was fully discussed at the meeting, and was settled as follows:

1. The Society of Telegraph Engineers shall consist of three classes, viz., members, associates, and honorary members.

2. *Members.*—Every candidate for transfer into the class of members shall have been previously elected as an associate of the Society, and shall come within one of the following conditions: He shall have been regularly educated as a telegraph engineer, according to the usual routine of pupilage, and have had subsequent employment for at least five years in responsible situations; or he shall have practiced on his own account in the profession of a telegraph engineer for at least two years, and have acquired a degree of eminence in the same; or he shall be so intimately associated with the science of electricity or the progress of telegraphy that the Council consider his admission to membership would conduce to the interests of the Society.

3. Associates shall be persons of more than twenty-five years of age, who are not necessarily telegraph engineers by profession, but whose pursuits constitute branches of electrical engineering, or who are, by their connection with science or the arts, qualified to concur with telegraph engineers in the advancement of professional knowledge.

4. Honorary members shall be either distinguished individuals, who, from their position, are enabled to render assistance in the prosecution of telegraphic enterprises, or persons eminent for science and experience in pursuits connected with the profession of telegraphy, but who are not engaged in the practice of that profession in Great Britain or Ireland.

5. The officers of the Society shall be a president, two-vice-presidents, and ten other members of council, being thirteen persons, who in all shall constitute the council, to direct and manage the concerns of the Society; also two auditors of accounts, a treasurer and a secretary. Such officers shall be elected or appointed annually in manner hereafter directed.

6. All these officers shall be elected from the class of members. The offices shall all be honorary.

The next meeting will be held on the 31st instant, at 3 o'clock, when the officers will be balloted for, and the Society of Telegraph Engineers will then take its place amongst the other scientific institutions of the day.—*Engineering.*

◆

ELECTRICITY AS A CURE FOR CANCER.—This agency is constantly employed in some London hospitals in the reduction of tumors and cancerous growths. An effective escharotic for the removal of external tumors is now being applied in London by Mr. Henry Robinson on "Michel's" plan. The preparation is made by rubbing asbestos between the hands to the finest possible fleecy powder, which is then thoroughly mixed with three times its own weight of strong sulphuric acid, and worked into the desired shape with a silver spatula. The tumor is covered to the depthth of half an inch with the mixture, which rapidly destroys the tissues directly beneath, without causing severe pain, local inflammation, or feverish symptoms in general. The adjoining parts of skin are protected by a broad circle of collodion and a thick pad of soft linen. The operation lasts several hours, and the wound should afterwards appear quite dry, dark and depressed.—*P. France.*

◆

IRON TELEGRAPH POLES.

Men of science, art and literature have united in doing honor to the inventor of the electric telegraph. Other inventors have been busy for years in constructing numerous instruments for the perfection of the system, until, in the line of delicate eppliances that add to the efficiency of the telegraph, there seems to be nothing lacking. It now seems to be worth the while of the telegraph companies, and especially those owning lines across the uninhabited western plains, to go back to first principles and enquire if a great improvement cannot be made in the construction of the line. It is manifest that the requirements of a line across the plains are far different from one in the mountains. In the mountains and on the rolling timbered lands in the States, there are prominent objects, higher than the telegragh line, to conduct the electric fluid in storms, and to break the force of the wind. On the plains nothing intervenes to check the force of the winds for hundreds of miles, and nothing projects itself so far above the earth as a telegraph pole. The result is thet the lightning during the summer, and the winds the year round, make perpetual havoc upon the poles, often breaking and burning the wire. Besides the great inconvenience of these frequent breaks,—whereby private business is lost, and press reports are paid for that are never received—a considerable force is required, and a perpetual expenditure for material is necessary to keep the line in tolerable repair. The railroad companies are making all sorts of changes to reduce the cost of repairs. The regular running expenses have long since been reduced to a minimum, and the managers are adopting expensive changes to reduce the cost of repairs, as for example, the substitution of steel rails for iron, the substitution of the modern splice for the old fashioned chair, and other as expensive changes in the rolling stock. True these improvements all add to the security and comfort of the passengers, but would never have been adopted for any other than economical reasons. It is regarded better to make a large expenditure in the lump, and have the advantage of a first class road, than to be making an annual expenditure several times larger than the interest on the sum required for the needed improvement and at the same time have a poor road.

Applying this principle to a telegraph line, it would seem good economy for the Western Union Company to substitute iron poles on the plains for the wooden ones that are the occasion of so much annoyance and expense for repairs. This, we are aware, is no new idea. Iron poles have been in use on the Panama line for years, where the frequency and severity of electric storms render a line of wooden poles useless. A telescopic iron pole has been invented, which, when closed, is about six feet in length, and when drawn out is about fifteen feet. It would probably be cheaper to construct these poles in sections, say three on one side and two on the other, fastening them by bands around the splices. They could, of course, be made as thin as they could be cast, and would have sufficient strength to resist any wind that would not uproot them. Such a line would suffer nothing from lightning strokes, and would secure perfect safety in offices during storms. The life of an iron telegraph pole, if kept painted, is hard to estimate. We do not see why it should not last a hundred years. Repairing lines would then become one of the least items of expense; and it would become more reliable than a railroad line, because less subject to the elements.

We hope to live to see the day when our Rocky Mountain papers can publish press reports via the Western Union Lightning and Storm Defying Iron Telegraph Line.—*Central City, Colorado, Register.*

From the Mechanics' Magazine.

ELECTRO-MAGNETIC MOTIVE POWER.

I have noticed that the subject of electro-magnetism has been discussed as a motive power, and that all chance of its success is condemned upon the ground that "zinc is dearer than coal, and that weight for weight it does not give anything like so much power." It seems to simply resolve itself into this, "that expense of the power is the objection." Has it never struck any of your correspondents that in the case of coal, no residue of any value is left, but that in the case of zinc (supposing we use Smee's battery), sulphate of the oxide of zinc only is formed in a very pure state, by the action of the battery, a quantity of which, a drysalter has informed me, is annually shipped from Hamburg to London, and sold here at 16s. a hundredweight, and that in a very impure state?

Can it be possible that all the great theorists have ignored such an important commercial item as this, in working out the relative costs of the two processes? I certainly must confess that I have never seen the fact of the value of the product taken into consideration at all, in any calculation. I am aware that the answer to this will be that it is not worth while to save such small quantities, and that it would not pay to take the trouble to evaporate the solution to get the crystals; but supposing electricity came into use more generally, would it not be worth while to throw the waste solutions of the battery into a tank, and let the water evaporate by the action of the sun or otherwise?

I have always been led to believe that in a mathematical calculation of the cost of two different methods, every element of saving ought to be taken into consideration, and if that be so, surely the value of the product ought to be greater than that of the original elements, because work has been done. I know I shall be answerd in this way: "The work done is the evolution of electricity;" but what I ask is this, "Is it at the expense of the zinc and acid?" I cannot see that it is. I say that it is simply the result of the chemical changes that have taken place in the battery, by reason of the combination of oxygen with the zinc, and the liberation of the hydrogen. I am aware that we did not get the power without consumption, but that consumption is water, not zinc.

In working out the power of coal with steam (which is the only recognized practical method, I believe), we do not decompose the water, but only change its nature into steam, by charging it with more heat than it can contain in its natural state. I may be wrong, but it seems to me to be so, as in an open vessel boiling water will not get hotter than 212°, however fierce your fire may be. I wish "Sigma" would answer this question: Does heat actually decompose water at all, and if so, what relation does coal bear to zinc in its capability of doing it? And also, is the power evolved greater by the decomposition say of a pint of water, than that evolved by its simple transformation into steam?

Again, I should feel it a favor if "Sigma" would kindly tell me the amount of sulphate I should get from say one hundredweight of zinc, dissolved by the battery process, and also how much acid it would take to do it, and also the amount of force evolved in doing it, and of water decomposed. I think if these questions are answered they will be generally interesting to all your correspondents, as they can all then find out the actual cost of a battery to give a given power.

The second great objection seems to be that the "power of the magnet decreases as the square of the distance increases." Will "Sigma" kindly answer the following questions in actual figures?

1st. If the above rule holds good in the permanent steel magnet only, or in that and also the electro-magnet.

2nd. Supposing an electro-magnet to sustain a weight of 1,000 pounds at contact, what will the same magnet attract at the following distances, 1-16, ⅛, ¼, ½, and 1 in?

I wish to have this question answered simply in figures, and not to have the diameter or length of wire or battery power imported into the question, as I give a given quantity of 1,000 pounds supported, and if there be any rule at all for the calculation, it must be the same for all size magnets, or the rule cannot be correct; or there must be one rule for permanent magnets, and another for electro-magnets; and again I think the rule must vary in even every electro-magnet, with the size and length of wire, diameter of core, and battery power. If this be the case, what is the use of such a fallacious rule that it alters at every variation of conditions, and yet when a question is asked as to the attractive power of the magnet, we have always quoted the above rule, and that seems to close the question.

Another question, and I have done. Supposing I have an electro-magnetic engine at work, and I let it run free without doing anything, and the battery working it dissolves say 10 pounds of zinc per day (I cannot say consumes), will it dissolve more if I put a resistance to that engine and so make it do some work? Of course I mean that the length of wire in the circuit is the same, and also the time each or all wires are in contact in both cases, and the revolutions equal in number. Again the question resolves itself into this:—Does a coil of wire connected with the poles use more zinc, if a bar of iron be inserted in the middle, and the magnetism used, than if it were kept hollow; I do not think it can, because the resistance is the same in both cases, and it must be so, unless the inductive power affects that resistance.

VOLTA.

From the Mechanics' Magazine.

EARTH BATTERY—ELECTRIC FORCE.

I have no faith in earth batteries for any purpose whatever, except working clocks (themselves of very little use). The simple question in all these cases is, what amount of work, measured definitely in foot pounds, do we want to do? Well, we know that a 5lb. weight falling say six feet—that is thirty foot pounds—will work a clock for days, for the work is simply the friction of the air and wheels; hence the very feeblest battery may supply the required force with adequate magnetic arrangements, though no magnetic arrangement whatever, devised or ever to be devised, will do more than apply the force given by the zinc consumed, just as an engine does that of the coal burnt under the boilers.

The earth battery is such a feeble cell, and it can only be one cell by any possibility, therefore can never yield "a power equal to three or four cells" of any battery; its electromotive force is very low, its internal resistance, owing to size of plates, very small for a small current, but immense if we try to get a large current from it, because we instantly exhaust the feeble chemical action.

For bells I am confident the manganese cell is the most convenient, but the work and power must be balanced in each case; not only must a sufficient series be provided to do the work, which a few strokes will settle, but the size of the cells, or, what comes to the same thing, the number coupled for surface and not in series, must be adjusted to the frequency of the calls on the battery, to meet the causes of what is unjustly called its irregularity. I say unjustly, because the cell is really a very steady and most useful one if properly employed for suitable purposes; but who would expect a pony—and he badly harnessed—to do the work of a dray horse? and this is exactly what people expect from their batteries.

It is useless to add "one or two" in series, as Mr. Smith suggests; if we find say three will give a good stroke on the bells, but after a time and many rapid strokes they fail, it is most likely that the remedy is to be found, not in using, say five in series, but six in two series of three united.

"Jack of All Trades" (p. 186, 1923), has carefully proved the truth of my remark as to the way in which "practical" men mislead themselves by neglecting first principles. Is it not extraordinary that he should suppose that people who are electricians, as "T. and S. should be ignorant of the fact" which he who calls himself *no electrician* imagines is to revolutionize electricity as a motive force; is it not still more wonderful that he did not at once see that he had discovered a mare's nest, seeing that the said fact (referred to by me, as it happens, p. 185) should be ignored by all the copper and silver depositors, most of whom have read Walker and Smee, the latter of whom, I rather think, originally suggested the idea? However, so far from being ignorant of it, I worked it myself some twenty years ago, in the hope of getting pure zinc plates to do away with the need of amalgamation, and the drawbacks which render the process commercially worthless would have been of no consequence to me. I actually produced a series of plates weighing some eight times the zinc dissolved, but they proved useless, as from the porous and rough nature of the surface they were worse than common zinc, and amalgamation even would not protect them.

Now, as I said, in this process no mechanical work is done, only the resistence of the liquid conquered, yet in accordance with the laws of electricity the conditions are utterly altered, and "Jack of All Trades's" first assertion, that one hundred times the metal might be deposited *in the same time* is where his error lies, for just as the number of actions is increased so does the work done in a given time in each action diminish, and on the one hundred plates no more would have been deposited, speaking roughly, than on one, but the action on, and waste of zinc in the cell would have been reduced to a corresponding extent. That is why the process is worthless practically, because the rental of plant, &c., becomes greater than the value of zinc and acid saved; besides which, much greater care is needed in adjusting the strength of solutions, &c., to the work doing, or else the work itself is easily spoilt.

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A RACE UP A FLAG-STAFF—TALL SPORT IN SAN FRANCISCO.

A sanguine and confident inventor presented himself a few days ago at the office of the Western Union Telegraph Company in San Francisco, and exhibited a pair of instruments, which he claimed to be perfection itself when applied to telegraph poles. These clamps were to entirely supersede the old fashioned, hooked shaped affairs which line repairers were wont to use in ascending the poles; they were so intelligent that they would almost climb of themselves, and a man ornamented with a pair might climb strait to the moon if a pole long enough could be procured. There happened to be incredulous individuals connected with the office, and these offered to back Dr. Valentine against the stranger. The challenge was accepted, and the Plaza fixed as the place where the contest should come off.

Dr. Valentine has long been connected with the company, is spryer than a cat, can determine the specific gravity of nitric acid by tasting it, and occasionally, for amusement, turns himself into a Grove battery—simply swallowing a pint of acid while in a trip bath, and inserting a platinum wire down his throat. The doctor has traveled to the top of every telegraph pole in the State, and occasionally recruits his health by a trip on foot to Healdsburgh or Gilroy, his only baggage consisting of his iron climbers, buckled to his legs, and a small piece of black pomade in his vest pocket.

The contestants met at the Plaza and took their positions at the foot of the flag-staff: the foreigner was confident and the docter supercilious. The word was given, and up the climbers dashed, jabbing their armed heels into the wood, and rushing hand-over-hand up the mast. The stranger did pretty well, but emulation lent additional speed to the doctor's heels; he fairly flew upward, like some aspiring spirit in eye-glasses. After climbing twenty-five feet the stranger stopped and looked upward. Away up by the cross-trees his humiliated eyes discovered the soles of two boots, a flaunting coat-tail, and two brown patches on a pair of black pantaloons.

It was the doctor, and there, away up on a level with the chimney-pot, he delivered one of his celebrated comic lectures.

The stranger, came down, and so, at length, did Valentine. The stranger explained that his failure was attributable to the fact that his climbers had been affected by the climate. "That's me," said the doctor: "I'm the Climb-it."

"But, yet, my instruments are superior," replied the stranger, "with them I can come down a pole eighteen feet high in four motions."

"See here, my venerable duffer," said Valentine, "I've climbed more poles than you have told lies, and that's saying a heap. I began before this heavy moustache of mine commenced vegetating; and I tell you that those climbers won't wash. If you don't take care, some day you will come down a pole in one motion instead of four, and the patent will die with you. Come, let's go get a little sulphuric acid; I'm dry."

The stranger thinks he can adapt his invention to climbing down wells, but he has about given up the telegraph-pole branch of the profession.

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TRANSMISSION THROUGH PNEUMATIC TUBES.*

The writer having been employed in designing the extension of a pneumatic dispatch line, in which some heavy gradients were unavoidable, it became necessary to ascertain by calculation the steepest gradient that could be employed, so as to obtain a sufficient carrying capacity in the new section of the line under given conditions of engine power and of length. Almost every text-book and paper on the velocity of gases in pipes, gave a different formula, and the author therefore found it necessary to attempt to construct a convenient expression for the speeds of carriers of given weight and friction, under various conditions of pressure, gradients and dimensions of tube. The problem of a pneumatic system is simply this: To make a given quantity of air expand from one pressure to another in such a way as to return a fair equivalent of the work expended in compressing it. It is obviously impossible to regain the full equivalent of the work, because the compression is attended with the liberation of heat, which is dissipated and practically lost. Therefore, in designing a pneumatic system, the first thing is to contrive means of compressing the air as economically as possible: and, in the second place, to get back the available mechanical effort stored up in the compressed air, irrespectively of the work employed in compressing and examining it. The writer considers that small pneumatic tubes may be worked more profitably than large ones. The great convenience of and the practical facilities for working small letter-carrying tubes have been amply proved by the extensive systems already laid down in Paris, Berlin, London, and in other towns, as adjuncts to the telegraph services. Tubes of somewhat larger diameter would undoubtedly work satisfactorily. Even still larger tubes, of a moderate length, might also be found useful for a variety of special applications. But the author does not believe that a pneumatic line working through a long tunnel could, for passenger traffic, ever compete in point of economy, with locomotive railways. A pneumatic railway is essentially a rope railway. Its rope is elastic, it is true, but it is not light. Every yard run of it, in a tunnel large enough to carry passengers, would weigh more than ½ cwt. And it is a rope, too, which has to be moved against considerable friction, and in being compressed and moved wastes power by its liberation of heat. In a pneumatic tunnel, such as that proposed between England and France, in order to move a goods train of 250 tons through at the rate of twenty-five miles an hour, it would be necessary to employ simultaneously a pressure of 1½ pounds per square inch at one end, and a vacuum of 1½ pounds per square inch at the other. The mechanical effect obtained of these combined—pressure and vacuum—would be consumed as follows:

In accelerating the air . .	29	millions of foot pounds
In accelerating the train .	12	
By friction of the air . .	5721	
By friction of the train . .	330	

The resistance of the air, therefore, upon the walls of the tunnel would alone amount to 93 per cent. of the total mechanical effect employable for the transmission; while the really useful work would be only about 5½ per cent. of it. And to compress and exhaust the air to supply these items of expenditure of mechanical effect, engines would have to exert over 2,000 horse power at each end during the transmission, even on the supposition that the blowing machinery returned an equivalent of mechanical effect such as has never yet been obtained. This would not be an economical way of burning coals.

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ELECTRICITY AND FRUIT TREES.

Amongst some clippings I find the following, taken from the letter of a correspondent of an American paper: "I had a very fine pear tree (Flemish Beauty) that became affected, first by blight in one limb, which I removed, and then another and another was affected in the same way, until I had removed a considerable portion of the top of the tree. Early next spring I resolved to try the application of scrap iron to the roots. I procured my iron, removed the soil from the roots carefully, deposited the iron between them, and replaced the earth. There was no further progress in the blight; the tree continued to grow that season, and the next leaves and blossoms came out vigorously; no black spots appeared on the leaves, and the tree bore finely, and no appearance of disease was seen in the tree afterwards. In subsequent conversations with friends I found that some of them had become informed on the same subject, and had tried the remedy with perfect success. Some told me they had procured turning and drilling chips from the machine shops, and had used them, as they thought, with much advantage to their trees." Now, it is a very common opinion amongst "thinking" gardeners that the blight of the potato plant is due to electricity in the air, and a correspondent has already spoken of the beneficial effects produced by iron filings applied to the tubers (p. 39). The well-known authority on matters horticultural and floricultural, Mr. Glenny, retains, in his 78th year, the opinion formed many years ago that the potato disease is caused in some manner by electric "fluid" (or whatever it is), and that its effects may be moderated by removing the tops of the haulm. Well, it strikes me that this application of iron to the roots of fruit trees is worth inquiring into, and it is possible that our friends "Sigma" and Mr. Tonkes may be able to throw a light upon it. I have often heard the remark "There is a blight in the air" made by gardeners, and sure enough their trees have been blighted—notably this present spring. Now, is this due to a peculiar state of the atmosphere in connection with electricity, and does the iron at the roots, by some magnetic property, protect the tree? Has the effect upon plants of an atmosphere largely impregnated with ozone been observed; and also that of antozone (if such a gas (?) really exists)? The subject is worth a little inquiry and experiment, for it is rather annoying, after getting your fruit blossoms safe over wind and rain storms to have them spoilt by a "blight" which *may* be averted by placing pieces of iron scraps at the root.

SAUL RYMEA.

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SUBMARINE CABLES TRUST.—A prospectus has been issued of the Submarine Cables Trust, for an amount of 1,000,000*l*. in Six per Cent. Certificates of 100*l*. each, at the price of 90. It will be constituted on the same principles as those which have already proved successful in the case of the Foreign and Colonial Trust Company, the object being to limit the individual risk incidental to these as to all other classes of public undertakings by distributing the investment over a number of companies, and in a certain sense "making one insure the other." Such surplus as may annually accrue after payment of the 6 per cent. interest, will be employed in buying up the certificates, and when all shall have been thus redeemed the Trust will be dissolved and the property divided among the holders of the "reversion coupons," one of which will be attached to each certificate in a form to admit of its being dealt with as an independent asset. The trustees proposed are persons of position and experience. —*Engineering*.

TELEGRAPHS.

The transfer of the telegraphs of Great Britain to the Government has proved to be a success—a success, that is, in comparison with the system which previously existed. The Companies had but one object, that of earning large dividends, and they pursued a policy which, whilst it no doubt had the immediate effect they desired, was narrow and illiberal, and utterly opposed to that full developement of telegraphic business which the interest of the country required.

There were a number of Companies—first as rivals, then as confederates—monopolizing the trunk lines of communication. In addition to these were a large number of other branch lines, with their own separate tariffs, generally equal, and sometimes exceeding, for insignificant distances of half a dozen miles, the charge of bringing the message over the main line for one or two hundred miles. There were also several hundred railway stations connected with the telegraphs, at which an extra charge of sixpence was demanded for porterage or the station master's "fee," and the great majority of these railway stations were altogether outside the town limits, and reached only at great inconvenience. There was no uniformity of rates either on the main or branch lines, and everything seemed calculated to complicate the simple business of transmitting an ordinary message, and to render it as difficult and costly an operation as possible. When it is added that, not long before the Government took charge of the business, there were nearly a hundred towns in England and Wales alone, with populations of not less than 2,000 inhabitants, with no telegraphic facilities whatever, it will be evident that the people of Great Britain owed a small debt of gratitude indeed to the Telegraph Companies.

The Government has done much to remedy this state of things. Already, the wires have been increased from 51,311 miles to 68,318 miles, and the number of offices open for business have increased to nearly 2,000, besides those at railway stations. Independent Press Associations to supply country papers and reading rooms with news have been established, and the amount of press news transmitted has been largely increased. The number of messages under the old system was 5,000,000 per year; under the new arrangements more than double that number, or more than 10,000,000 per annum are being transmitted. So far, the change has been successful.

Financially, however, it can scarcely be called a success as yet, whatever the result may be hereafter. The original estimate of the cost of acquiring the property of the Telegraph Companies, and of making the necessary extensions and additions, was £8,100,000, sterling. Before the arrangements were completed however, for the transfer, it was ascertained that this sum required to be more than doubled, and it is found that the total cost to the Government before all claims are settled will amount to something over ten millions of pounds. The budget submitted to the English Parliament by the Chancellor of the Exchequer last month gave a deficiency on the estimates for the telegraph service for the year, of £177,174, and the official reports disclose the fact that the number of complaints average one for every six hundred messages transmitted. While, therefore, it may be justly claimed that in some respects the Government has accomplished much in the way of reform, it is evident that much still remains to be done before the service brought into a condition of unqualified success.

There is nothing to show that what has been gained by the nation paying an enormous price for the lines, and passing through a transition stage of confusion and serious inconvenience, might not have been brought about easily and profitably if the old Companies had been influenced by proper public spirit, and had seen clearly what must have resulted to their own ultimate advantage.

We have an illustration of this in the case of the telegraphs of the Dominion. The Montreal Telegraph Company and its immediate connections are at the present time working over 12,000 miles of wires, which would be at the rate of nearly 100,000 miles to a population equal to that of Great Britain, against the 68,000 really in existence; and the number of offices open for business in the Dominion, as compared with Great Britain, bears a similar proportion. Let it be remembered that Canada is a young and, as yet, a poor country. Great Britain, on the other hand, is the centre of the world's wealth and commerce, as well as the seat of the government of a vast empire. If we were to challenge a comparison on these bases, the result, as is seen, would be immensely in favor of Canadian independent enterprise, against even the improved governmental system of England. The wires of the Montreal Company and its connections are transmitting at the present time about 1,500,000 messages a year; the British Government telegraphs, as we have said, about 10,000,000—another proof, the relative circumstances being taken into account, of the greater comparative development of our own system. Mr. Scudamore appears from his report to think he has done well to have reduced the number of complaints of irregularity in the transmission of messages, to one in six hundred! In the Dominion these complaints do not reach one in six thousand. Then again, notwithstanding the new organization we have alluded to for supplying Press news, the amount of such matter transmitted by British telegraphs is small compared with that of the Canadian telegraphs. In making these comparisons it must not be forgotten that there are with us competing lines in the field, and it is well it should be so, but we take our illustrations from the oldest and largest—the Montreal Company. That company last year transmitted no less than 8,000,000 words of news messages, and in a single night during the Parliamentary session at Ottawa, has sometimes sent from that point alone, reports extending to 65,000 words over its wires.

We should be less confident as to the logical inferences to be drawn from these facts, if there were any indications that our private undertakings regarded their present organization as complete, but the reverse is the case. Very recently the announcement of a uniform 25 cent rate showed the Montreal Company was determined both to cheapen and simplify its tariff, and in a few weeks hence, when extensions now going forward are completed, over the whole distance from the Western frontier to remote Gaspe, messages will be carried at that rate. The same Company will, we are informed, during the current year, erect 760 miles of additional posts, nearly all for new extensions into remote parts of the country and some 2000 miles of fresh wires, opening at the same time nearly one hundred offices. The telegraph enterprise of Canada is admitted to have attained an exceptional degree of efficiency and cheapness, and it is but right that this should be acknowledged. With such an experience before us we need desire nothing better than its steady progress in the present hands. Even if no political reasons suggested themselves for prefering to keep the telegraphs under the control of independent commercial companies, it would be difficult to see wherein we should better ourselves by following in this instance the English precedent.—*Monetary and Commercial Times of Toronto, Canada.*

THOMSON'S SYPHON RECORDER.

This consists of a very powerful electro-magnet, between the poles of which is suspended a core wound with fine silk-covered copper wire. This wire is put in the circuit of the telegraph line, through which the signals are received. The reading of the signals is effected by means of a syphon of capillary glass tube, about 2 in. long, the shorter end of which dips into a dish of ink, while the larger hangs down in front of a paper strip moved forward by clockwork. The miniature glass syphon is connected by a very fine aluminum wire, with the coil suspended between the poles of the electro-magnet, and is moved backwards and forwards as it is deflected to the right or the left. The way in which the ink is got through the capillary tube, and not only got through it, but actually ejected in a tiny stream from the lower end of the syphon, is by the simple and ingenious expedient of keeping the ink electrified to a high tension. When any liquid is electrified, its particles repelling each other, it is enabled to flow through the finest orifice; and this fact has enabled Sir William Thomson to produce a frictionless pen-point. The electrification of the ink in the reservoir is done by a rotating electrophorus or replenisher, kept in movement by an electro-magnetic machine.—*Mechanics' Magazine.*

RESPONSES TO "THAT KISS."

Cadiz, O., June 29, 1871.

Mr. Reid—*Dear Sir*: Thanks for that *kiss* by *proxy*. How well you seem to know just what we feel. How our hearts swelled when we received father Morse's greeting. Do you wonder that deep feeling caused the hand to tremble. That very joy opened up the fountain of tears, while we read from his own hand, "S. F. B. Morse."

How often since we have learned his name have we wished to see him who bears it, and now his greeting seems like his hand, extended in token of his loving heart. We grasp and kiss it. God bless our father Morse and all his children.

Pennsylvania lies between us. We cannot easily kiss you all the way across. Please just take the will for the deed and accredit the same to four young lady students of this office, and your humble servant,

"M."

Abington, June 27, 1871.

To J. D. Reid, Esq.:

Dear Sir; enclosed please find my share of the "token of affection" you so kindly tendered our "Father of the telegraph," in behalf of the lady operators on the evening of June 10th.

Please accept many thanks for the favor conferred, and hoping none of the sisters will keep our good representative in waiting a just remuneration,

I remain, yours in the Morse fraternity,

Op'r, Abington, Mass.

A WARNING.

We have received the following:

"On monday afternoon, July 3d, during a thunderstorm along the Juniata river, the lightning struck the telegraph office at Thompsontown, Pa., (a station on the Pennsylvania Central R. R. about 35 miles west of Harrisburgh,) splitting the window casing and the operating table. The lightning then glanced off, striking Miss Jennie V. Crane, the operator, on the cheek and side of the head, leaving a scar and rendering her insensible for some time. When last heard from Miss Crane was doing well and no serious results anticipated. Her escape from instant death seems miraculous."

N. Y. July 10th 1871.

Note. If Miss Crane had paid her indebtedness to us promptly, even by mail, perhaps the lightning would not have collected it from her in so rude a way! It is not too late now.

RECEPTION FUND.

Deficit, stated July 1		$133 74
Cash Receipts.		
W. P. Lenning, Gasport, Ind	$2 00	
A. T. Hart, opr., " "	1 00	
E. A. Holt, Windsor Locks, Conn	1 00	
L. W. Adams, Bartonville, Vt	1 00	
Wolfe & Dusenbury, 1 Rector St., N. Y.	5 00	
T. E. Rawlings, Wenona, Ill	1 00	
F. W. Sawyer, Adrian, Mich	1 00	
Chas. W. Cropper, Rock Island, Ill	1 00	
W. B. Sylvester, Clinton, Mich	1 00	
Sarah E. Dun'am, Arlington, Mass	1 00	
Sale of Photo. of Statue	50	15 50
Balance of Deficit		$118 24

Subscribers to the extinction of the deficit receive an engraving and autograph of Professor Morse, and we doubt not that in this easy manner it will be soon extinguished. All bills are paid. Hereafter we will send two engravings and autographs for $1, to one address.

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THE PAINE-MOTOR.

If this does not prove the most extraordinary discovery of the age it will certainly have to be named the most extraordinary fraud. From the knowledge we have on the subject there would seem to be no middle ground. The machine has certainly performed continuously with a three-horse power, driven apparently by a two-cell battery at an insignificant expenditure of zinc. Expert witnesses testify to this. A three-horse power is not so small a matter that it could be so easily obtained by some concealed motor eluding the search of intelligent eyes. There has been a suspicious delay in making application to actual work of this wonderful discovery, as there has been abundant time since the first machine was put up to multiply copies and set them to practical duty. It is only fair however to give them time for the elaboration of improvements. It is undoubtedly true that a number of prominent capitalists and electricians are sufficiently satisfied with the prospects of success to be Mr. Paine's backers, and we are told that a few weeks will settle the question. The *Scientific American*, representing orthodoxy on the subject, is very decided, not to say curt, in the matter. Orthodoxy is generally right, and adventurers who proclaim revolutionary discoveries before these discoveries are made good in actual practice, are generally wrong, almost always foolish, but in rare instances victorious. The *Scientific American*, in common with most of the regular authorities in mechanics, is quite beside itself on any hint of perpetual motion, and when Mr. Paine very foolishly proclaims that he can realize 2,000 horse-power from three grains of zinc, it is like flinging a red cloth before a bull. Any one is safer in being skeptical on hearing such bluster as that. Nevertheless a candid person must admit that this ghost of perpetual motion which is invoked so frequently to frighten inquirers is a nuisance, and tends to repress the investigation of truth. The men who use it have no clear idea of what they mean. Perpetual motion in the Universe is a fact; in terrestrial mechanics it is, under present reasonings, an impossibility on account of gravitation. And yet we know too little about the forces that play around us to aver that none of them can ever be harnessed to our machines, in such way as to produce what would in our present state of knowledge be called perpetual motion. The science of mechanics is about the most complete of all, and from the nature of the subject the one most susceptible of the clearest determinations, and yet even in this sphere, the most completely within our mind's grasp, there are a multitude of questions which a layman may ask that an expert cannot answer.—*Christian Union.*

A NEW ELECTRICAL THEORY.—M. Becquerel has just communicated to the Academy of Science in Paris a new hypothesis concerning the origin of atmospheric electricity. In his opinion, its source resides in the sun, which, according to the recent discoveries of Mr. Norman Lockyer, is surrounded by an immense envelope of hydrogen which, being mixed up with a considerable portion of watery vapor, is therefore positively electrified. This communicates its fluid to the whole mass of ethereal substance which fill the interplanetary spaces, and thence to our atmosphere. But as the latter is a bad conductor, the consequence is, according to our author, that the upper strata of the air must be saturated with positive electricity. Here, says a French journal, we pause to ask what evidence he has, in the first place, of the existence of this ethereal substance; and secondly, of its conductibility? M. Becquerel does not think it necessary to stop at such details, but seeks to establish his theory by various arguments, such as, for instance, the fact that in vacuo an electrified liquid evaporates more rapidly than when not in that state; and an aurora borealis is accompanied by a noise which he finds to be exactly the same as that produced by an electric spark.

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TELEGRAPH CABLE FROM MARSEILLES TO ALGIERS.—The India-Rubber, Gutta-Percha, and Telegraph Works Company are in receipt of a telegram from Sir Samuel Canning announcing the successful laying of the cable from Marseilles to Algiers, contracted for by them with the French Government. This new cable furnishes a direct and independent line for the transmission of telegraphic messages between France and her Algerian colony.

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BRAZILIAN TELEGRAPHY.—The Brazilian Government has determined to proceed immediately with the construction of a line of telegraphy from Sao Joao de Barra to Pernambuco. A line of telegraph between Paranagua and Coritiba was opened as far as Antonina, April 2.

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THE MADRID GAZETTE announces that the privilege to lay a submarine cable between England and Coruna has been withdrawn.

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THE line between Singapore and Hong Kong has been successfully laid, and is now open for traffic.

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P. F. W. & C. R. W., June 28, 1871.

Dear Mr. Editor:—On the evening of the 10th we brought our wife and a few invited friends to the office, to hear the farewell words of Prof. Morse. Our wires were connected via. Pittsburgh, Cleveland and Buffalo, and after the usual interruptions by plugs along the line, we heard something like the following:

"All telegraphers - - - - - - - God bless you.

S. F. B. MORSE."

After a few more "breaks" and interruptions, the operator at Buffalo or Cleveland sent us the following, which he said was the Morse message:

"Greeting to all telegraphers throughout the world. Peace on earth, good will to men. God bless you all."

Having been sorely disappointed in not being able to attend the inaugural ceremonies at the Park, we congratulated ourselves upon having at least received the farewell message of our dear old friend, and felt comforted accordingly. Now can you imagine our disgust, upon receiving the JOURNAL a few days ago, to find that we had been most egregiously humbugged, not having received the message as sent, or intended to be sent, by Prof. Morse?

Yours, in disgust, H.

OMITTED RESPONSES.

ST. LOUIS, June 10, 1871.

Hon. Wm. Orton, Pres't Morse Reception, Academy of Music, New York:—Missouri congratulates Professor Morse most heartily, and will perpetuate his great name and invention by furnishing, from her iron mountains, the material for iron telegraph poles and wire for all future ages. R. C. CLOWRY.

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Hon. Hugh Allan the well known president of the Montreal, Quebec and Liverpool Steamship Company, has promptly remitted, through John Horn, Jr., Esq., the hundred dollars needed for the lettering on the Morse statue.

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AN OPERATOR MURDERED.

We have before us a lengthy article respecting the death of James E. Lyons, formerly of the New Orleans office of the W. U. Tel. Co., who lost his place because of intemperate habits. He was brutally killed by the keeper of the boarding house where he resided because, so the report goes, of non-payment of his board. It is the old story of rum and ruin. The details are not of sufficient interest to publish.

On being notified of the death, his late associates in the New Orleans office and a few railroad men at once made up a purse to secure his decent burial. A neat coffin was purchased, and a handsome hearse conveyed his remains to the cemetery. Young Lyons received the blows of which he died June 17, and died on the 19th.

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ENTERPRISE.

Two ladies, Miss M. L. Smith, and Miss A. M. Gleason, one a native of the Sandwich Islands, the other of one of our Indian settlements, both daughters of missionaries, towards the close of 1870 started a line of telegraph in New York from Broad street to Union square, with four offices in circuit, headquarters being at the Grand Central Hotel. The line was opened March 1st. The idea was to have a clear line to a few points, so as to send what they received promptly. These ladies are succeeding in their work. They are sole proprietors, and practical operators.

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"Timothy J. McSweeney Esq., a well known Western Telegrapher who graduated at the last term of the Albany Law College, was examined before the Supreme Court at its last General Term in the third Judicial district, and admitted to practice as an attorney before the Courts of this State.

Mr. McSweeney is a young gentleman of splendid natural parts, an indefatigable student, and if he does not place his name upon the tablets which bear those of his celebrated countrymen, Grattan, Curran, and O'Connell, we will acknowledge ourselves misinformed as to his abilities."—*Communicated.*

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RONDOUT, N. Y., June 28, 1871.

To the Editor of the Journal of the Telegraph:

I have just built a telegraph line from West Hurley, Ulster co., N. Y., (on the Rondout and Oswego R. R. Co. Telegraph line) to the Overlook Mountain House in Ulster co., N. Y. The line passes through the town of Woodstock to Overland Mountain House. This house is a new hotel of large dimensions built on the highest peak of the Catskill range of mountains. It is about ten (10) miles south of the Catskill Mountain House new offices, Woodstock, Ulster co., N. Y., and Overland Mountain House, Ulster co., N. Y. Tariff from Rondout, N. Y., 30 and 2 to both offices.

Yours, respectfully, WM. WINTER.

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THE British Telegraph Department is prepared to lay private wires between a place of business, or private establishment, and a postal telegraph office on easy terms. A rate of £7 per mile per annum, over house or underground, or £5 along a road, will rent a wire; £25 will purchase a printing telegraph and battery; and £7 10s. per annum will cover the cost of the maintenance and repair of the apparatus, and even the supply of paper ribbon on which the messages will be printed; £5 5s. will pay the clerk's services for issue, and a sum of 3d. for each message within the free limit.

Journal of the Telegraph.

This Journal is issued on the 1st and 15th of each month. Its circulation is 6,500. It goes to every State, Territory, and Province on the continent. It is fast becoming a necessity, and is already welcomed as a friend. No better medium for advertising exists.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, JULY 15, 1871.

THE TELEGRAPH AND EDUCATION.

We had the honor, a few days ago, of being called upon to respond to a toast to "The Telegraph," at an alumni dinner of one of our most promising Universities. To some present it may have seemed foreign to the occasion, and seized upon by the genial president as an opportunity to signify a personal prelation to the respondent. Yet nothing could have been more consistent. The telegraph has become the avenue of the active brain of all the earth. As Dr. Sanson tersely and truly said, "the telegraph has widened the range of human thought and observation, and has thus given new comprehensiveness to literary furniture." Sensibly with many, and insensibly with many more, the telegraph incorporates itself already as one of the great elements of the world's mental activities, and claims the notice and the regard of every thoughtful man.

It is a source of profound gratification to us to perceive to how large an extent, also, the fortunes acquired by the chief actors of the telegraph system of this continent are seeking educational channels for their ultimate development. There is nothing grander in history than the consecration of an immense fortune, by the Hon. Ezra Cornell, to provide a university where adequate preparation for any pursuit can be provided to the youth of the nation at a minimum cost or at none. The vast buildings at Ithaca, with their constant accretion from new donors, are monumental both of the founder and of the source of the wealth which raised them. They are a gift to ages yet to come. They are pillars on which the coming glory of the nation will lean, and from which the young bright brain of a golden era will yet emerge and be regnant in the generosities and labors of a profounder future.

The call on us, referred to above, had special significance in the gift of Hon. Hiram Sibley, of Rochester, N. Y., of the means to erect a magnificent building for the library and museum of Rochester University, and which had just been communicated by the Board of Trustees. It is known that Mr. Sibley has just performed a similar act of intelligent philanthropy to Cornell. This latest gift, however, is one which marks the culmination of a University which we believe will leave a magnificent impress upon the age, and to which it will be largely indebted to the fortunes of the telegraph. The nominal gift to Rochester is stated as, at least, $75,000. It means that a building, massive and befitting a great educational enterprise, at whatever cost, shall be given to the city of his permanent home. The gift will lighten all his after life and make his name memorable.

And this gift will not end there. Other fortunes, similarly acquired, will feel the touch of the same fire, and go out on like errands. Thus the telegraph, alike in its character as the highway of the thought, and in the tide of its fortunes to the support and erection of centres of literature and education for a nobler civilization, will gather upon its broad brow the greenest and fairest garlands which the age can bestow.

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ELECTRO-MOTIVE POWER.

The publication of a letter from Mr. Paine, the offer of a premium of $100,000 by the State of New York for a new motive power for canal navigation, and the remark of the Hon. Horace Greeley, in his Texas speech, that if man "does not yet harness the electric fluid to his plow, his boat, his wagon, and make it the most docile and useful of his servants, it is because he is still but little advanced from barbarism," have all tended to re-awaken notice to a subject which we believe will yet largely occupy the national attention. It has already opened a copious field for correspondence in England, some clippings from which, carelessly culled at a period of physical depression, partly fills our present pages. The language of Mr. Greeley would, had it come from our lips, been laughed at as a new burst of moonshine. It is a subject for all minds, however, to linger at and ponder, when in the quiet of an aged man's study, and that man one of the foremost intellects of the age, he writes these words, "essentially, the lightning garnered in a summer cloud should be as much at man's command and as subservient to his needs as the water that refreshes his thirsty fields and starts his hitherto lifeless wheels."

The letter of Mr. Paine, published on our first page, has this significance only, and it is surely enough to demand a passing notice, that he has maintained a two horse power for four months, by the use of a Daniells' battery of four cells, at an expenditure of a few cents per day. We believe this to be true. We wish Mr. Paine had said no more. It is the sufficient proof of any possible power which may be required. On the same shaft on which the wheel, five inches wide by eighteen diameter revolves, 50 or 100 other wheels may be placed, and even if such added wheel requires a battery of its own, it would be the cheapest motive power, except that derived from natural sources, such as water, of which the world has yet dreamed. But when the diameter is increased from 18 inches to as many feet, the possibilities of the motor, whose maximum power is all expended on the periphery, and these wheels susceptible of easy multiplication, the mind at once feels that here is a power which touches on great necessities, for which it may prove the coming gift, and for which we patiently and reverently wait.

The delay in its offer to public use seems a just one. Power realized suggests other capacities which a discoverer who would secure permanent success, must reach if possible. We have not seen the engine or any new products of it for many months, but we learn that increased study and renewed experiment confirm all our former statements with more marked results. Meanwhile, we recommend all journalists who are felicitating themselves on having pricked a humbug, to be patient, as we design to be, and Mr. Paine to write no more letters until his work is done.

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THE INFLUENCE OF THE JOURNAL.

RANTOUL, ILL., June 20, 1871.

To the Editor of the Journal of the Telegraph:

I have been a constant reader of the JOURNAL since the issue of the first number, and I feel under so many obligations for its multitude of useful suggestions pertaining to practical telegraphy; its words of kindness and encouragement to the members of the craft throughout the land; its sympathy and substantial aid extended to those of our number in need of a kindly word or a helping hand; its valuable contributions to a most intricate though interesting and beneficial branch of science; and, above all, its steady efforts to elevate our calling by inculcating principles of sobriety, integrity and faithfulness among us, that I can scarcely withhold longer, a public acknowledgment of benefits received.

There seems to be an unavoidable tendency in the exciting, slap-dash business of telegraphing, as also in the business so nearly akin to it, *railroading*, to make men profane, rough, intemperate, selfish, overbearing, and unmindful of the feelings and welfare of others; and, without some effective counteracting agency, it is difficult to conceive to how great an extent the followers of these occupations would abandon themselves to these unaimable, anti-christian habits and qualities.

That the JOURNAL has exerted a most wholesome influence, and accomplished a vast deal of good in each of the above-named particulars, must be evident to all who have been favored by its visits, and had an opportunity of witnessing its results.

In this expression of appreciation and thankfulness, therefore, I doubt not that I am joined by thousands of brother (and sister) operators all over the American continent.

I disclaim all intention of flattery in asserting what I believe to be strictly true: that few editors are more highly esteemed or beloved by their readers than is James D. Reid, editor of the JOURNAL OF THE TELEGRAPH.

In conclusion, allow me to offer a *business* suggestion. Instead of publishing the tariff changes in the JOURNAL, would it not be a great saving of labor to print them in the circular form, leaving one side blank, so they could be cut out and *pasted* in their appropriate places in the Tariff Book or Supplement? This would not only save copying by hand, but the names of all offices, being printed, (they could be arranged alphabetically as heretofore,) would be much more convenient for ready reference than if entered in writing, as at present. Perhaps this plan could not be made to apply to all classes of changes, as those of number, name, &c.; but for *new* and *other line* offices I think it would be a decided improvement over the present arrangement.

Very truly yours, E. J. UDELL.

MODEL LINES.

The following report of tests recently made on the Western Union lines between Reno and Corinne.

The line in question consists of two No. 9 galvanized wires, suspended by hard rubber hook insulators inserted into cross arms, which were boiled in coal tar.

There are 30 poles per mile, and the wires are about 36 inches apart. The circuit from Reno to Corinne is 556 miles. No. 1 line works into repeaters at Reno and Corinne, and is used for the through business. No other instruments in circuit except at Elko. No. 2 is worked as a way line between Reno and Corinne, with nine relays in circuit.

The lines over the entire distance are in perfect order; not an insulator displaced, nor a pole out of line or plumb, and the wires are as evenly stretched as on the day the line was completed.

The average of several tests by the direct and by the loop methods at each end, showed the resistance of the entire line looped to be 17 ohms per mile of wire, and 20 ohms per mile, including eight instruments, in circuit. These measurements were subsequently verified by tests of the line in shorter sections.

The insulation tests showed a resistance approximating infinity, and almost beyond the range of the testing instruments (a Varley differential, with a shunt of 10,000 and a Rheostat of 10,000 ohms). With six cells of Grove battery, the lowest measurement equalled 17,000,000,000 ohms per insulator; and another test for resistance between the wires, with everything disconnected from the earth, equalled 80,000,000,000 ohms per insulator.

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FROM POLE TO POLE.

A merchant going home elevated, staggered against a telegraph pole. "Beg your pardon," said he, "I hope no offence. It's rather dark, and the street is so narrow, you see."

In a few moments he came in contact with another pole. "Couldn't help it, sir," said he, lifting his hat; "I never saw such crooked lanes as we have in this city!"

Again he ran foul of a pole, this time with a force that sent him backward to the ground. "Look here, neighbor, you needn't push a fellow down because he happens to touch you: the road is as much mine as yours, and I have as much right to be here as you have, you old stick-in-the-mud!"

He picked himself up, and made another effort to reach home, but he soon came plump against another pole.

"I shan't make any more apologies," said he; "if you get into the middle of the street and stand in my way, that's your look out, not mine."

Proceeding on his journey again, and becoming dizzy, he seemed to be entangled in an inextricable labyrinth of telegraph poles, which led him to make a general speech. "Gentlemen, you are not doing the fair thing. You do not give a man a chance. You run from one side of the street to the other, right in my way."

Just then he met a friend, and taking him by the hand, he said: "There is a procession going along the street, and every man is drunk; they have been running against me all the way. I knocked one of the fellows down, and one of the fellows knocked me down, and then a lot of them got around me, and I believe they would have licked me within an inch of my life if you had not come to my rescue. Let us get out of the street before the procession comes back, for they are all drunk."

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
July 15, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since July 1, the date of the last tariff order.

Managers are hereby required to enter these changes in their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

246 Ackworth, Ga. Re-opened.
94 Aqueduct, Pa.
* Aurora, Erie Co., N. Y.
233 Boston, Ky.
490 Burton, Texas. Re-opened.
66 Brisbin, N. Y.
* Crete, Neb.
* Carmi, Ill.
* Dorchester, Neb.
253 Dupont, Ind. Re-opened.
480 Eagle Lake, Texas. Re-opened.
15 East Bridgewater, Mass.
* Enfield, Ill.
* Elma, N. Y.
140 Foxburgh, Pa.
233 Georgetown, O.
110 Henrietta, N. Y.
* Holland, N. Y.
413 Huttersville, Ark.
457 Hepler, Ks.
* Ingleside Hotel, Mass.
* Jerry's Run, Va.
* Lookout Mountain House, Tenn.
* Louisville, Neb.
* Omaha Junction, Neb.
Ophyr, Utah. Tariff same as San Francisco, Cal.
Oconomowoc, Wis. Heretofore an other line office. Tariff 35 cents more than Chicago, Ill.
17 Old Orchard Beach, Me.
367 Palo, Iowa.
* Protection, N. Y.
427 Princeton, Mo.
112 Petersburg, Pa.
467 Prairie City, Ind. Ter.
477 Prior Creek, Ind. Ter.
* South Wales, N. Y.
Simpson's Springs, Utah. Tariff same as Austin, Nev.
427 Trenton, Mo.
* Waverly, Neb.
133 Warm Springs, Va.
* Whycocomagh, C. B.
Yosemite Valley, Cal. Tariff 50 and 5 cents more than Sonora, Cal. Check San Francisco, Cal.

SUMMER OFFICES RE-OPENED.

113 Cresson Springs, Pa.
39 Clarendon Springs, Vt.
* Deal, N. J. Tariff 20 and 2, Long Branch, N. J.
133 Hot Springs, Va.
133 Healing Springs, Va.
54 Kingston, Md.
* Mt. Vernon, N. H. Tariff 35 and 3, Keene, N. H.
* Rocky Point, R. I. Tariff 30 and 3, Providence, R. I.
142 Rockbridge Baths, Va.
142 Rockbridge Alum Springs, Va.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Aurora, Erie Co., N. Y.,	30	2	Buffalo, N. Y.
Carmi, Ill.,	120	9	Vincennes, Ind.
Crete, Neb.,	90	6	Plattsmouth, Neb.
Dorchester, Neb.,	100	7	" "
Enfield, Ill.,	130	10	Vincennes, Ind.
Elma, N. Y.,	30	2	Buffalo, N. Y.
Holland, N. Y.,	35	2	" "
Ingleside Hotel, Mass.,	15	1	Holyoke, Mass.
Jerry's Run, Va.,	65	4	Richmond, Va.
Lookout Mt. House, Tenn.,	60	4	Chattanooga, Tenn.
Louisville, Neb.,	35	2	Plattsmouth, Neb.
Omaha Junction, Neb.,	35	2	" "
Protection, N. Y.,	35	2	Buffalo, N. Y.
South Wales, N. Y.,	35	2	" "
Waverly, Neb.,	60	4	Plattsmouth, Neb.
Whycocomagh, C. B.,	35	3	Plaister Cove, C. B.
Newport, Que.,	30	2	Send and check via most direct route.

OFFICES CLOSED.

Belmont, N. Y.; Bedford, N. S.; Choshaw, Ala.; Grand River, Ind. Ter.; Gainesville, Ala.; Iuka, Miss.; Pond Eddy, N. Y.; Penola, Va.; Riggston, Ill.; Saltillo, Miss., and Shubenacadie, N. S.

Business for Belmont, N. Y., formerly an Erie Railway office, should be checked to Phillipsville, N. Y.

GENERAL INFORMATION.

The following is a revised list of offices on the Alabama and Chattanooga Telegraph Line, with "tariff for other lines" from Chattanooga, Tenn., and Meridian, Miss. Business should be sent and checked via. whichever may be cheaper route.

Attalla, Ala.	60	4	Chattanooga, Tenn.
	95	5	Meridian, Miss.
Collinsville, "	80	3	Chattanooga, Tenn.
	100	7	Meridian, Miss.
Carthage, "	95	6	Chattanooga, Tenn.
	85	4	Meridian, Miss.
Eutaw, "	100	7	Chattanooga, Tenn.
	45	3	Meridian, Miss.
Epps, "	105	7	Chattanooga, Tenn.
	40	3	Meridian, Miss.
Elyton, "	80	5	Chattanooga, Tenn.
	90	5	Meridian, Miss.
Fort Payne, "	40	3	Chattanooga, Tenn.
	105	7	Meridian, Miss.
Greenpond, "	85	6	Chattanooga, Tenn.
	75	5	Meridian, Miss.
Kennedale, "	90	6	Chattanooga, Tenn.
	65	4	Meridian, Miss.
Livingston, "	105	7	Chattanooga, Tenn.
	35	2	Meridian, Miss.
Morganville, Ga.	25	2	Chattanooga, Tenn.
	115	8	Meridian, Miss.
Sulphur Sp'gs, "	30	2	Chattanooga, Tenn.
	110	7	Meridian, Miss.
Springville, Ala.	70	5	Chattanooga, Tenn.
	90	5	Meridian, Miss.
Toomsuba, Miss.	115	8	Chattanooga, Tenn.
	25	2	Meridian, Miss.
Trenton, Ga.	25	2	Chattanooga, Tenn.
	110	7	Meridian, Miss.
Valley Head, Ala.	35	2	Chattanooga, Tenn.
	105	7	Meridian, Miss.
Wauhatchie, Tenn.	25	2	Chattanooga, Tenn.
	115	8	Meridian, Miss.

A number of the above offices have heretofore been published in JOURNAL.

Twenty cents in addition to the square rate will be charged for messages to Mountain House offices, in New Hampshire.

The name of the office heretofore known as Bridgeport, Washington Co., Ill., has been changed to Okawville, Ill., and Clinton, N. J., to Annandale, N. J., and that of Keystone, Ind. to Montpelier, Ind.

Bar Harbor, Mt. Desert, and East Eden, Me., are one and the same place.

Earlville, N. Y., is now an "Other Line" office, tariff 25 and 2 from Oneida, N. Y.; check Oneida.

Hereafter, the "tariff for other lines" from Plattsmouth, Neb., to South Bend Neb., will be 35 and 2.

63 Aurora, N. Y., is in Cayuga Co.

CUBA CABLE BUSINESS.

We are notified that the West India and Panama Telegraph Company have opened offices at the following points, viz: St. Thomas, Porto Rico, St. Kitts, Antigua, Guadaloupe, Dominica, and Martinique. The line between Kingston and St. Thomas not being completed, messages will be sent by mail, between those points, and will be forwarded by telegraph from St. Thomas, at the following rates in gold, viz:

From St. Thomas.	*10 words.*	*Each add. word.*
To Porto Rico, St. Kitts, and Antigua,	2.00	.20
" Guadaloupe, Dominica, Martinique,	3.00	.30

Charge 25 cents gold for postage from Kingston to St. Thomas. Tariff to ST. THOMAS will be same as to Kingston, with 25 cents additional postage.

In messages forwarded by wire from St. Thomas, the words "Post Kingston, wire St. Thomas" must be inserted and counted.

Should sender desire message mailed from Kingston direct to destination, instead of by wire from St. Thomas, the words "Post Kingston" must be inserted and counted. On such message only 25c. postage must be added to Kingston tariff.

WM. ORTON, President.

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A NEW DANGER TO OCEAN CABLES.—Supt. Heiss has placed a new item upon the list of dangers to which ocean cables may be subjected. The Cuba cable had, during the past year, been so frequently injured or broken, that a careful examination was decided upon, the result of which was to the effect that the damage was to be ascribed to the loggerhead turtles. In many places, the cable presented the appearance of having been bitten through; and in others of having been crushed from both sides until it had become so much flattened as to destroy its conductivity. This is further confirmed by the fact that at the depths where the breaks and injuries occur, there the loggerheads most abound. The company has sent an order for a much larger and stronger cable, and when it is laid, the assailants will have something more substantial than the present steel-wound cable, upon which to whet their teeth.

We publish the following as possessing interest to the members of the Telegraphers' Insurance Association.

C. H. THOMPSON v. THE MUTUAL AID AND BENEVOLENT LIFE ASSOCIATION.

Judge Collens delivered the following opinion in this case:

This is an action on a policy of insurance. The plaintiff claims a certain amount as being due by the Mutual Aid and Benevolent Life Insurance Association, on account of a policy of insurance issued in favor of Mrs. Adelia Thompson. It appears that the terms and conditions upon which this insurance was effected were that the insured should pay a stated assessment at the death of each of the parties insured by that association; and it is claimed as a defence in this suit that Mrs. Thompson did not pay the assessment made upon all the insured on the occasion of the deaths of one or two members of that association.

The rules provide that as soon as one of the insured dies, notice of his death shall be given for five consecutive days through the newspapers published in the city to all the living insured, who are thus notified of the death, and called upon to pay the assessment which they contracted to pay when they accepted a policy of insurance from the company. After the five days' notice, the insured have still thirty days within which they are allowed to comply with their engagements in relation to the payment of the assessment; and after the expiration of these thirty days, in case of non-payment, the policy issued is declared to be forfeited. After this forfeiture twenty days more are given to the insured party to the end that he may adduce good and sufficient reasons explanatory of the non-payment of the assessment; and it is provided that if the association deem the reasons good and valid, the insured will be reinstated in all his rights under the policy of insurance.

In this case the five days' notice was given as required. The thirty days after the termination of the five days' notice also expired, and no payment of the assessment called for was made by Mrs. Thompson. Her representatives in the present suit attempt to explain why the payment was not made by her within the thirty days required by the policy of insurance.

It is immaterial to pass upon the question whether or not the reason adduced was a sufficient and valid one, because, under the terms of the contract between Mrs. Thompson and the insurance association the only reason which could rehabilitate her in her rights under the policy originally issued should have been presented by her to the consideration of the association within twenty days after the expiration, of the first thirty days. Her legal representative not having attempted to show within that time to the association any good reason why Mrs. Thompson did not pay the assessment imposed upon her, I do not think they can now, in the present suit, show any reason whatever. Whether that reason would be a good and valid one or not in my judgment, it comes too late. The contract in relation to that point must be strictly interpreted, for it is at best a grace which is allowed to the insured with a view to reinstate himself in rights which his own negligence had caused to be forfeited.

Considered in that light, it would be unfair and unjust to the insurance association to extend that faculty in favor of the insured beyond the length of time which the contract or policy of insurance itself gives. There must be judgment in favor of defendant.—*Case in N. Orleans.*

TELEGRAPHERS' LIFE INSURANCE ASSOCIATION.

ACKNOWLEDGEMENT OF REMITTANCES.

Assessment No. 21.

Occasioned by the death of John Calvin Christie, of New York, June 7th, 1871.

2	4	5	6	7	8	12	13	15	16	17
19	21	22	23	25	28	30	33	40	41	42
43	44	46	52	53	56	59	60	64	65	69
71	72	73	75	77	80	83	85	87	88	93
95	97	99	101	103	106	107	111	113	117	122
129	131	134	136	139	140	143	145	146	154	156
157	158	160	164	166	175	176	177	179	181	182
183	185	186	187	188	189	190	191	192	193	197
198	199	200	201	202	208	209	210	211	213	215
220	225	230	231	232	233	236	238	240	242	243
244	247	254	256	257	258	262	263	264	265	266
267	269	271	273	274	276	277	278	279	280	281
282	283	284	285	286	287	291	294	297	301	302
303	311	312	315	316	319	322	323	327	328	330
332	340	341	342	343	344	346	347	349	350	351
352	353	371	372	374	376	379	380	381	383	385
386	389	391	392	393	394	396	397	398	405	406
407	411	412	413	416	417	420	425	426	428	429
434	438	441	445	451	453	455	456	457	476	478
482	483	484	485	493	494	495	496	497	499	500
503	504	505	506	507	508	509	510	511	512	515
516	520	526	532	533	536	547	548	549	552	553
554	555	556	557	560	561	563	564	569	573	574
577	579	583	584	586	587	589	592	594	595	597
600	602	604	617	619	622	623	625	626	628	630
632	635	636	639	646	648	649	656	670	671	673
678	679	680	685	686	690	692	697	698	702	703
704	710	711	714	715	716	721	722	723	724	727
728	729	734	735	737	738	740	741	743	744	758
762	763	766	769	772	773	774	775	776	778	780
781	782	783	784	785	786	790	795	798	799	800
802	803	804	809	812	813	816	817	818	820	821
823	825	830	832	836	837	838	841	842	843	844
848	850	856	859	870	873	874	875	876	880	883
886	896	897	900	901	904	905	906	907	910	917
914	916	917	918	922	923	926	930	931	932	936
939	940	941	942	943	944	945	947	948	952	953
954	955	956	957	958	959	960	963	964	966	968
976	977	978	979	980	985	986	987	990	991	992
994	995	998	1000	1001	1002	1006	1007	1009	1010	1013
1014	1016	1017	1019	1024	1026	1028	1029	1030	1031	1032
1033	1034	1035	1037	1039	1040	1042	1045	1046	1047	1048
1050	1053	1054	1055	1056	1058	1059	1060	1061	1062	1063
1071	1072	1073	1074	1075	1076	1077	1080	1081	1084	1085
1087	1088	1091	1093	1094	1104	1160				

◆

The vote in the case of Mr. Rugg, of Saratoga, stands—

In favor	35
Against	162

◆

The Overlook Hotel Telegraph Line is completed and in operation. The line was constructed under the direction of Mr. William Winter, of this place. The first dispatch sent read "How are we for high?" As it was sent by a Hill from on top of the Overlook, it *was* pretty elevated.

◆

PITTSBURG, June 5.—A telegraph operator named W. H. Davy, of Mansfield, Ohio, employed in the Western Union Telegraph office in this city, disappeared last night, leaving a note in which he threatened to commit suicide, and giving as a reason that he was disappointed in love and pecuniarily embarrassed. He was a cripple.

THE TELEGRAPHERS' INSURANCE.

Some time has now elapsed since we have referred in any special manner to this organization. This has been caused, not by any indifference to its value, or want of appreciation of its moral power, but, simply, because, being its custodian and chief representative, we have feared to press what might be felt to be largely personal, and lacking those general features which justified a general appeal. We allude to it now as due to the influence it exerts upon American telegraphy, and which may yet largely widen until it be regarded as a great social and industrial bond and necessity.

The Association was organized early in November, 1867, Mr. David R. Downer being its founder and its first secretary. Its basis was simple, requiring only ability to work, good character, and an initiatory fee of a dollar and a half—the dollar for the first death, the half dollar for expenses. After the first payment, assessments of one dollar were to be made as deaths occurred. No salaries were to be paid. Every thing collected was to go unbroken to heirs. Nothing simpler could be devised, and, under this organization, twenty families have been relieved, where, in almost every case, suffering would have ensued.

The deaths have been as follows:—

Seba B. Christie, New York, died July 10, 1868.
Edwin A. Hall, New York, killed July 20, 1868.
John T. Winne, Troy, N. Y., died Nov. 23, 1868.
J. S. Vandusen, Sandy Hook, N. J., died Jan. 29, 1869.
James A. Allen, Detroit, Mich., died Feb. 1, 1869.
J. Frank Stevens, Cincinnati, O., died March 2, 1869.
W. W. Shipman, Brooklyn, N. Y., died Feb. 7, 1869.
C. J. Gaines, Richmond, Va., died May 26, 1869.
J. Bobenna, Edgefield Junction, Tenn., died Sept. 12, 1869.
W. H. Cody, Hamilton, O., died Oct. 16, 1869.
M. B. Graham, Cincinnati, O., died Jan. 26, 1870.
Charles D. Smith, Chicago, Ill., died March 3, 1870.
John C. Gregg, Atlanta, Ga., died at Buffalo, N. Y. March 12, 1870.
Arch. Craig, Memphis, Tenn., died Aug. 8, 1870; congestion.
William P. Jones, Evergreen, Ala., died Oct. 2, 1870; Typhoid.
E. W. Mason, Atlanta, Ga., died Oct. 23, 1870, Typhoid.
R. W. O'Brien, Minneapolis, Minn., died Nov. 4, 1870.
Geo. M. Harrison, Albany, N. Y., died Dec. 22, 1870.
D. W. Warner, Cincinnati, O., died Jan. 16, 1871.
Josiah A. Cure, New York, died March 8, 1871.
John Calvin Christie, died in New York, June 7, 1871.

The first amount paid was to the mother of Seba B. Christie, $274; the last to Mrs. Cure, $677. The highest amount paid was to the mother of George M. Harrison, Albany, N. Y., $729, a number of new members having joined since the previous death. These payments were gladly received, yet we confess to a feeling of shame that out of a membership of 1,000, over 302 should be marked as delinquent, and excluded. At the present date 1,140 certificates have been issued, of which 20 have been cancelled by death, and about 300 by delinquency. A number of applications have come in quite recently, making a reliable membership of about 800. What is wanted is a thoroughly responsible membership of at least 1,000, and a prompt attention to assessments. This will make a handsome provision for heirs, and can be easily secured by the connection of leading managers and superintendents with the Association, thus adding to its moral and monetary force as a vital element of telegraphic life.

The executive officers of telegraph companies owe much to organizations of this kind for the element of fellowship and earnestness which it infuses into telegraphic labor. It gives an impulse and direction to that which no officer can afford to dispise, the cultivation of the filial and parental instinct which hallows labor by making it subserve affection. When a young man is called on to send a dollar for what may one day wipe the tear from his mother's eye, or give his children bread, he is, by that very necessity, wrought into a truer and better man.

◆

BORN.

NEW MANAGER OF THE W. U. TELEGRAPH OFFICE IN TITUSVILLE, PA.—Our readers will be somewhat surprised to learn that a new manager of the W. U. Telegraph line, in this city, arrived yesterday. He is *small*, but betokens a "bud of promise." His "catch weight" was 14 pounds. We understand our friend Lucas will remain in charge of the office yet for several years (!) until his *little son* becomes sufficiently posted in the business! The salary of the little stranger has not yet been fixed by the Company!

STOY.—To Harry R. Stoy, manager Athens, Ga., Office, June 26, a daughter; weight, 9½ lbs.; first child.

MARRIED.

SIMONS—MORSE.—At the residence of the bride's father, Dundee, Mich., Wednesday, June 28, 1871, by the Rev. Wm. Taylor, M. R. Simons, extra operator L. S. & M. S. R., to Miss Ella M. Morse, of Dundee.

DIED.

CHRISTIE—In New York, June 7, 1871, John Calvin Christie.

M. A. BUELL,

Manufacturer and Dealer in all kinds of

Telegraph Supplies.

A VERY FINE NEW STYLE

SMALL SOUNDERS,

Sent C. O. D., for

$6.00.

LEARNERS' INSTRUMENTS,

With instructions,

$7.00, $10.00 & $12.00.

Best Quality and Improved Patterns of

MAIN AND LOCAL ZINCS,

Kept constantly on hand,

AT GREATLY REDUCED PRICES

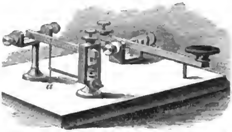
Materials for Private Telegraph Lines,

With instructions for putting up and operating.

M. A. BUELL,
26 Waring Block, Cleveland, Ohio.

MECHANICAL TELEGRAPH INSTRUMENT,

PATENTED MAY 31st, 1870.



For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

This instrument is an outgrowth of this pressing demand. The Inventor is himself a practical operator, now in active service. Operators and others wishing to teach or learn the Art, will be delighted with this instrument.

It can be placed anywhere, as it does not occupy a space more than six inches square.

Its cost is but $7, and there is no expense whatever to keep it constantly in working order.

We will send a copy of SMITH'S MANUAL, free of charge, with each instrument, to individuals or clubs. The instructions in this Manual are particularly adapted to those who wish to learn by sound.

Special and liberal terms to manufacturers.

Remittances can be made by certified draft on New York, Cleveland, or Pittsburgh, money by express, charges paid, post office order, or registered letter at our risk.

Parties ordering instruments, from points except well-known cities, will please give the name of county and State.

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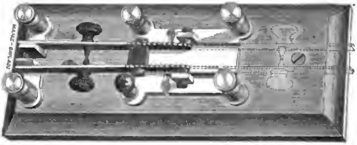

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We have ample facilities for the execution of every variety of electrical work.

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For the accommodation of the
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both plain and Galvanized, in Bond, ready for shipment from New York.

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This Brand of Wire is the best in the world, and has been adopted exclusively by the Western Union and many other Telegraph Companies.

We also continue to import this Wire for use in this country, notwithstanding the high rate of duty imposed by Congress in the interest of the monopolists. Any amount of it can be seen at our store at all times. The import duty on wire is now two cents per lb. gold, and 15 per cent. *ad valorem*.

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Telegraphers'

Mutual Life Insurance Association.

INCORPORATED UNDER THE LAWS OF THE STATE OF NEW YORK.

I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificate and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and the payment of dues.

XI. A meeting for the election of officers shall be held annually during the first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written request of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer.

GERRITT SMITH, Secretary.
A. S. BROWN,
W. H. HILL,
D. R. DOWNER,
Executive Committee.

DIRECTIONS TO APPLICANTS.

1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to Gerritt Smith, Secretary Telegraphers' Mutual Life Insurance Association, 145 Broadway, New York, and a certificate of membership will be sent by return mail.

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

5. No letters can be answered unless a stamp is enclosed for postage; and as the officers labor without compensation, correspondence requiring answers should be as limited as possible.

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CASTS,
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and all descriptions of Fine Art Models.

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CAN BE USED WITH ANY PEN.

WRITES TWO THOUSAND WORDS WITH ONE DIP OF THE PEN IN THE INKSTAND.

These Holders will be sent by mail, post-paid, on receipt of the price, on the following terms:

Cedar Holders, for Desk	$0 50
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Six Cedar Desk Holders to one order	3 00

Send Registered Letter or Money Order for safety.

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OPINIONS.

NEW YORK, March 18, 1871.
Telegraph operators especially will find it almost indispensable after once having used it. All who have used it in this business speak very highly of it.
FRANK L. POPE,
Associate Editor of the "Telegrapher."

NEW YORK, April 21, 1871.
I fully accord in the above opinion of the Self Supplying Pen-Holder, having tested it for some time.
SAMUEL F. B. MORSE.

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Respectfully inform their customers, and all parties purchasing

TELEGRAPH AND ELECTRIC MATERIALS,

that they have been appointed by

SAMUEL C. BISHOP, OF NEW YORK,

General Agents for the sale of any articles manufactured by him

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They are now prepared to fill promptly any orders for goods on hand, or to be manufactured, at Mr. BISHOP's prices in New York.

The long experience of Mr. BISHOP in the manufacture of

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INSULATED WIRES,

of various kinds, insulated with pure Gutta Percha, renders this arrangement a very important one for our numerous patrons throughout the country, and we confidently recommend these goods to their especial notice as being fully equal, if not superior, to any other in use.

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(Any size required.)

Gutta Percha Covered Telegraph Office Wires, in great variety of size and style.

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for out-door use and office connections.

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Cotton and Silk-Covered Wires, both twist and braided.

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MANUFACTURERS of every description of

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Manufactures and has for sale the various kinds of

OFFICE AND MAGNET WIRES,

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For Telegraphing, Plating, Electrotyping and Experimenting.

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We would call your attention to our

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Having completed our arrangements to manufacture, by putting in new machinery, and with a full force of workmen, we are now ready to supply the GREAT DEMAND for these Badge Pins. They are made of 18k gold, and are perfect fac-simile of the present MORSE, or curved lever keys, and the new style WESTERN UNION straight lever and FANCY BASE KEYS. We are now making two different sizes, one to be three-quarters of an inch long, and the other one inch long. Also, a very small, neat, BADGE KEY PIN for LADY OPERATORS. These are the only badge pins ever got up exclusively for Operators.

We are, also, manufacturing a complete set of RAILROAD BADGE PINS, for CONDUCTORS, BAGGAGE-MASTERS, BRAKEMEN, STATION AGENTS, and others, consisting of Punches, Passenger Cars (Pullman's Palace Pattern), Switch Targets, Coupon Tickets, &c. These Badges are all made of the most approved patterns.

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Key Pin, oval base, one inch long	$6 00
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Key Pin, fancy base, (for Lady Operators)	6 00
Key Pin Charm (for Watch Chain)	$5 00 and 6 00

☞ The above are made with straight or curved Levers. ☜

Conductor Punch Pin	$4 00
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Persons ordering Key Pins, be particular in giving style of lever and base wanted.

Any of the above will be forwarded by express, C. O. D., or by mail, registered, by sending amount and twenty-five cents extra to pay postage and registration fee.

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This system of Fire Alarm Telegraph, with a central office, or upon the

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The distinctive features of

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are a Combination of Circuits, the Automatic Signal Boxes, Electro-Mechanical Bell and Gong Strikers.

THE AMERICAN FIRE ALARM AND POLICE TELEGRAPH is covered by some twenty patents. Very early after its introduction into Boston, GAMEWELL & Co. purchased the original patents of FARMER & CHANNING, and during the past fifteen years have spared no expense or pains to improve and perfect this system.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy upon application as above.

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The Compound Wire has now stood every test to which it can be subjected. Over twelve hundred miles of it are now in operation with the most satisfactory results.

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On hand and furnished to order.

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Of any number required.

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GUTTA PERCHA or COTTON COVERED

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REGISTERS,
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REPAIRERS' TOOLS,
&c., &c., &c., &c.

OF EVERY DESCRIPTION.

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Of any desired Size and Pattern, American Manufacture.

We shall be happy to answer all enquiries and furnish any required information promptly.

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Kerosene Head Lamps,
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For Strength, Beauty of Finish, Lustre of Reflector, and power to throw light a great distance, the Lamps of our manufacture stand unrivaled. Testimonials from prominent Railroad Officers all unite in pronouncing our Patent Head Lamp

THE BEST BURNING LIGHT EVER SEEN.

CONDUCTOR LAMPS.

Best Conductor Lamp, with reflector (Nickel, Plated)....	$20 00
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OVERLAND TELEGRAPH TO AMERICA.

The success which attended the Atlantic Telegraph Cables led to the abandonment of the earlier projected scheme of telegraphic communication between Europe and America, *via* Siberia, Behring's Straits, and Alaska. It may be remembered that the Russo-American Telegraph Company, or as it was more properly called, the "Western Union Extension," was organized for the purpose just indicated, at New York in the summer of 1864. The idea of a line from Europe to America by way of Behring's Straits had indeed exercised the minds of telegraphists for some years previously, having been suggested as early as 1857 by Mr. Perry McD. Collins, after a journey made by him in Northern Asia. But the scheme never received much countenance or support till the failure of the first Atlantic cable directed public attention to the subject of this overland route. Mr. Collins's proposal was—to state it somewhat more explicitly—to unite the telegraphic systems of America and Russia by a line through British Columbia, Alaska, and North-eastern Siberia, meeting the Russian lines at the mouth of the Amoor river on the Asiatic coast, and forming thus one continual girdle of wire nearly round the globe. Like all unsuccessful ventures in this age of progress this scheme has been speedily forgotten. It has at least, however, by the surveying expeditions which it was the means of sending out, greatly extended our geographical knowledge of Alaska, Kamtchatka, and other previously-unexplored regions of Northern Asia. It is true that this Overland Telegraph to America has been obliged, in the meantime, to succumb to its successful rivals, the Atlantic Cables. The time, however, is, we venture to think, not very far distant when—in consequence of the extension of the telegraphic communication just opened up with China, the development of the Russian system, and the carrying on of lines in America to British Columbia and Alaska—much of the information contained in this book, and in the defunct Western Union Extension Company's surveying expedition, will be reinvested with interest and importance in the eyes of telegraphists themselves. In consequence of the high pitch of perfection which has now been attained in the manufacture and working of submarine cables, it may be questioned by some whether it will ever be worth while to carry an Asiatic and American Telegraph so far north as Behring's Straits merely for the sake of having a somewhat shorter cable, which was the reason which induced the projectors of the Western Union Extension Company to adopt this route. On this point Mr. Kennan says:—"I believe that this is a much more practical route for a line to China than the one recently proposed by Mr. Collins, *via* the Aleutian Islands, Kamtchatka, and Japan. Labor in Siberia is very cheap, and almost any desired number of men can be engaged at Yakootsk for about forty dollars a year and subsistence. Horses can also be purchased at Yakootsk and Kolyma to the number of five or six hundred, at prices varying from fifteen to twenty-five dollars. Nothing need be brought except wire, insulators, and tools, and a small quantity of provisions for a limited number of foremen. If there were any call for it, I believe that a line could be successfully built from Behring's Straits to the Amoor river, in two years, at an expense not exceeding 250,000 dollars."

◆

TRANSMISSION OF SOUND BY WOODEN RODS.

An interesting modification of Wheatstone's celebrated experiment of the Telephonic Concert was recently tried at the Central High School of Philadelphia. A rod of English deal, about twenty feet in length and three-quarters of an inch thick, was let down through a platform into the room below. Insulation from the platform and the ceiling of the lower room was obtained by inclosing the rod with small sections of thick rubber hose. Against the lower end of the rod the sounding-box of a small tuning-fork was placed. On speaking or singing into the open end of this, the sounds were transmitted by the rod to the room above, the volume of the sound being increased by placing a guitar on the upper end of the rod.

The experiment is exceedingly interesting and striking. Although the interval between the notes is perfectly preserved, their intensity and quality are changed very decidedly, the effect being similar to that produced by ventriloquism. As the position of the rod is immaterial, striking effects can be produced as though by ventriloquism. A small figure placed on the end of the rod or on the sounding-box adds greatly to the effect. A song is transmitted in a very amusing manner. As it is preferable to have the sounding-box held so that the pulses should impinge in the direction of the length of the rod, the experimenter in the room beneath rested, for convenience, on a settee. This mode of transmission of sound does not, of course, give as good results as by means of hollow tubes, as the transmitted sound cannot be heard at as great a distance. It is interesting, however, from its novelty.—*Journal Franklin Institute.*

◆

In the workshops of the London Central Telegraph Station two lathes cut the paper for the Wheatstone Automatic and Morse printing instruments. These lathes, working nine hours daily, cut 750 coils of Wheatstone and 3,390 of Morse printing riband per week; the central station alone consumes 150 coils of Wheatstone and 1,890 of Morse riband per week. These two lathes, however, can supply the whole Kingdom.

◆

Rates for Telegraphing Public Business.—The Postmaster General has, in accordance with the Telegraph Act of 1866, fixed the rates of telegraph communication between the several departments of the Government and their officers and agents, which have priority over all other business. These new rates are exclusively confined to public business. One cent per word is named for each circuit of 250 miles or less. All the words of the communication transmitted are to be counted excepting the date and place at which such communication is filed. The rate for Signal Service messages and reports is two cents per word for each circuit or distance, irrespective of the length of the same. The rates took effect July 1.

◆

INSULATED CORES—THE PHENOMENON OF NATURAL DISCHARGE.

From the Mechanics' Magazine.

Whenever a submarine cable, during the process of its manufacture, is being tested, it is generally usual to discharge it through a sensitive galvanometer before taking the test, so that if there be any electricity in the wire it may be discharged, in order that the condition of the cable may be as normal as possible. When this operation takes place, a discharge of variable force has almost always been observed.

If a core, covered core, or cable have both its ends insulated, and it be discharged (one end remaining free) through a Thomson's reflecting, or other sensitive, galvanometer, a *positive* current will be noticed going to earth. While the cable is thus to earth a slight permanent *positive* deflection will be observed.

If one end, or both ends of the cable be to earth, *no* discharge is perceived, but the permanent current will be at once seen. The following points are especially noticeable about this discharge:

It has been observed with almost every coil or wire, before testing goes on, varying only in *force*, the sign being always positive.

It is observed at all *temperatures.*

It is always *positive.*

Its *force* increases almost directly, according to the *time* the wire remains *insulated.*

It takes a certain definite time to arrive at a maximum.

It is proportional to *length* of wire.

It has been observed in a newly-manufactured coil before having any current in, and before it has been put into water.

It has been observed in uncovered coils, in served and in sheathed cores under all conditions, after being electrified and thoroughly discharged, and after the cable has been for days without a current being passed into it.

When hitherto seen, it has, without the sign of the current being observed, been attributed to "electrification," but it cannot be due to that, for the following reasons:

The wires, when tested, are operated upon with *negative* currents. So long as the wire remains in an "electrified" condition, it must have been *negative*, and the discharge consequently of a *similar* sign.

This discharge was invariably *positive*; wires have been *negatively* electrified and *positively* electrified; after being thoroughly discharged, a new discharge appeared always of a *positive* sign, increasing in force according to the length of time the ends were left free.

With an electrified body capable of absorption, or holding a "residual" charge, it will be found that at equal intervals the discharges gradually decrease in force until no further discharge is obtained. With the cable and its positive discharge, the discharges at equal intervals are equal, and at increasing intervals increase in force. So much so, that, by keeping on discharging the cable, an amount of force might be obtained—that is the sum of all the discharges—greater than that of the original discharge.

For these reasons it cannot be due to "electrification." But a stronger proof against this theory can be given—viz., that the discharge has been obtained from a coil *never* electrified, one fresh from the manufactory, where no wires are tested nor have currents passed in.

Similar discharges have been obtained from a "condenser;" one series of plates being in connection with the earth, precisely similar effects to those previously given have been obtained from the other series of plates.

The following tests were taken on a length of core of one nautical mile, and on a length of sheathed cable of 18 miles, containing four wires. A series of 12 tests of the latter, putting the cable to earth for one minute, then freeing the end for one minute, produced similar results.

Two other tests were taken. They are proportional as to time, but being taken at different times and with different sensibility of instrument, are not proportional to each other as regards length.

Eighteen miles of cable—

To earth 1 min., free 1 min., discharge = 92°

To earth 1 min., free 2 min., discharge = 190°

One mile of core—

To earth 1 min., free 1 min., discharge = 2°

To earth 1 min., free 2 min., discharge = 4°

The following test is peculiar:

One of the wires of the same cable (not tested for *two* days) was discharged.

A positive discharge was observed = 1450°

Put to earth again and then kept free for 40 min., and discharged = 1280°

Put to earth again and both ends *sealed.*

After an interval of 19½ hours A one end carefully cut by an insulated person, B still insulated. A discharged to earth .... = 1550°

1 minute, free afterwards, discharge .... = 120°

2 min., free afterwards, discharge = 210°

On the following day the discharge from the same cable was for the same wire, 1500°.

The explanations which have been offered to account for these phenomena are, first, that the core or cable forms an electric element or battery; secondly, that the effects are due to induction, the effect of the negative state of the earth itself; thirdly, that the cause is due to conduction, the atmosphere being in a positive state.

Many experiments have been undertaken to prove the last theory, more especially with condensers, by placing one side of a condenser to earth and freeing the opposite plates. They, after the same period, exhibited positive or negative electricity, according as the room was electrified positively or negatively from a large battery; but some experiments with the cable seem to show that some other explanation must be looked for than the above. The case we have mentioned, where the ends of the cable were sealed and the accumulation of electricity still went on, is decidedly against this theory.

There is some reason, however, in the first explanation that the effects are due to the core or cable itself forming an element. In the core of a sheathed cable this may be seen in the fact that the copper wire represents the positive element, and the iron wire the negative, separated from each other by the dielectric or gutta-percha to some extent porous, but so far from being properly porous that but small effects are obtained from such an amount of surface as the copper and iron represent. The space between the metal being always moist, it is easy to see that some electrical action must arise. The electricity, though small, obtained from this source, is accumulated in the core of the cable, and this peculiar battery, which at any moment gives but feeble effects, will, in the course of time, through the cumulative action of the core itself, give forth instantaneous currents of comparatively great power.

This explanation seems satisfactory as regards sheathed cables or core immersed in metal tanks, but the same effects are seen with a core in the open air. Where then is the negative element?

The remaining explanation is that the various phenomena are due to the inductive action of the earth assumed to be negative. This explanation fully accounts for every phenomena, but then it becomes necessary to assume that the earth possesses negative electricity instead of being *nil*. If we can assume that the effects are due to induction every phenomena is easily explained, and the inductive action of the earth would readily account for the accumulation in the core as well as in the sheathed cable.

An experiment was performed in the four wire cable previously spoken of which will illustrate the inductive effect of one electrified body upon another not electrified.

The object of the experiment, one out of many, was to observe the effect of the lateral induction in a compound wire cable. One wire of the cable was kept permanently charged with the negative current from a source of ten elements. The wire was, therefore, permanently negative. One of the other wires, insulated at its opposite end, was connected to a well insulated key, so that it could be discharged to earth through the galvanometer. The following are noted as the principal results:

The induced charge was *positive.*

The quantity depended upon the *time* the wire was kept insulated.

The quantity was proportional to *length*; this was proved by a similar experiment upon two of the wires, representing double the length, so that the induced electricity discharged from both wires might represent the sum of the two.

It will be seen that the result of this experiment showed precisely the same characteristics as the natural discharge of a cable, and indeed similar results were obtained from a submerged cable with its sea end insulated. This cable, after being without a test for several days, gave, when next tried, a strong positive charge.

MECHANICAL EQUIVALENT FOR ZINC.

To the Editor of the Scientific American:

In your journal of the 24th of June, you assert that the "mechanical equivalent for twenty-two pounds of zinc, or the consumption of that quantity of zinc in such a manner that its total mechanical effect could be realized, would be a duty of two horse power maintained for nine hours." I am aware that it is the accepted formula of eminent scientists, and it is my purpose in this paper to prove that, as far as the researches of any public scientist are concerned, the world knows nothing about the mechanical equivalents of zinc, under combustion in a battery. Dr. Page, backed by eminent scientists, estimated three pounds of zinc to the horse power; Liebig, sixty-four pounds.

Joule and Scoresby are capital experimentalists, and good orthodox authority, men who assert that the duty of electromagnetic motors is as the quantity of zinc consumed in a given time. Well, they constructed such an engine, and found that one kind of battery consumed a third more zinc than another. A Daniell's battery uses seventy-five pounds, and a Grove's only fifty pounds, to do the same duty. Common sense might pertinently here enquire, if the different condition under which the zinc is consumed in the Grove battery gave it such an immense advantage over the Daniell, whether, in still other conditions, in some other battery, the quantity of zinc might not be still further reduced. The experiments of Joule and Scoresby, and also those of Jacobi and others, prove only that the work done is as the conditions under which the zinc is consumed, and not as to its quantity. This question of equivalents is, however, foreign to my purpose, and I will proceed to show, in a clear and unmistakable manner, that even three pounds of zinc is not requisite to the production of one horse power per day of twelve hours.

An electro-magnet, with limbs (one fifth of the area of the limb should be bored out) eight inches in length, and two inches diameter, bound with 1,100 feet of No. 14 wire, will lift fifty pounds at one tenth inch, under the action of four Bunsen eight inch cells. One hundred and twenty of these magnets, so arranged that their coils connect with a commutator making one revolution per second, will raise one hundred and twenty times fifty pounds one tenth inch high per minute, or 360,000 pounds one tenth inch high per minute, which, reduced to foot pounds, gives us a duty of 3,000, just one eleventh part of a horse power. Now, let us find the quantity of zinc consumed in the above duty. Four eight inch zincs, under the resistance of 1,100 feet No. 14 wire, will, in twelve hours lose just three ounces of their weight. We, therefore, have a dynamical value of one tenth of a horse power for a twelve hours, at a cost of three ounces of zinc, or one horse power for thirty-three ounces of zinc, three ounces less than three pounds. If it be alleged that such an arrangement of magnets is impractical for the continuation of motion, I reply that I am not now discussing the application of battery forces to purposes of motive power, but showing that the potential value of the battery has been extremely underrated.

In a future communication, I will as clearly show that the battery cost has had nothing to do with the non-success of electro-magnetic motors; that if the electric currents were generated absolutely costless, they never would have been more than a large toy.

H. M. Paine.

ELECTRIC TELEGRAPHY IN 1787.

An old work, "Arthur Young's Travels," published in 1798, has a few words on an electric telegraph device which is worthy of passing note in these days of telegraphic progress, and of honor to those whose efforts have made this application of electricity a practical success:—

"In the evening to Mons. Lomand, a very ingenious and inventive mechanic. . . . . In electricity he has made a remarkable discovery. You write two or three words on a paper; he takes it with him into a room, and turns a machine inclosed in a cylindrical case, on the top of which is an electrometer, a small, fine pith ball; a wire connects with a similar cylinder and electrometer in a distant apartment, and his wife, by remarking the corresponding motions of the ball, writes down the words they indicate, from which it appears that he has formed an alphabet of motions. As the length of the wire makes no difference in the effect, a correspondence might be carried on at any distance; within and without a besieged town, for instance, or, for a purpose more worthy and a thousand times more harmless, between two lovers prohibited or prevented from any better connection. Whatever the use may be, the invention is beautiful."

THE GENERAL OCEANIC CIRCULATION.

The temperature soundings, taken in the Lightning and Porcupine Expeditions, with trustworthy instruments, have shown :—(1.) That in the channel of from 600 to 700 fathoms depth which lies between the North of Scotland, the Orkney and Shetland Islands, and the Faroes, there is an upper stratum of which the temperature is considerably higher than the normal of the latitude; while there is a stratum occupying the lower half of this channel, of which the temperature ranges as low as from 32° to 29°·5 ; and a "stratum of intermixture" lying between these two, in which the temperature rapidly falls—as much as 15° in 100 fathoms. (2.) That off the coast of Portugal, beneath the surface stratum, which (like that of the Mediterranean) is superheated during the summer by direct solar radiation, there is a nearly uniform temperature down to about 800 fathoms; but that there is a "stratum of intermixture" about 200 fathoms thick, in which the thermometer sinks 9° ; and that below 1,000 fathoms, the temperature ranges from 39° down to about 36°·5. (3.) That in the Mediterranean the temperature beneath the superheated surface stratum is uniform to any depth; being at 1,500 or 1,700 fathoms whatever it is at 100 fathoms, namely from 56° to 54°, according to the locality. To these may be added (4) the observations recently made by Commander Chimmo, with the like trustworthy thermometers, which, in lat. 3° 18¼′ S., and long. 95° 30′ E., gave 35°·2 as the bottom temperature at 1,806 fathoms and 33°·6 at 2,306 fathoms. These seem to be the lowest temperatures yet observed in any part of the deep ocean basins outside the polar area.

It is clear, therefore, that very strong evidence now exists, that instead of a uniform deep sea temperature of 39°, which, on the authority of Sir James Ross, by whom the doctrine was first promulgated, and of Sir J. Herschel, by whom it was accepted and fathered, had come to be generally accepted in this country at the time when the recent deep sea explorations commenced, not only is the temperature of the deeper parts of the Arctic basin below the freezing point of fresh water but the temperature of the deepest parts of the great oceanic basins, even under the equator, is not far above that point. And it seems impossible to account for the latter of these facts in any other mode, than by assuming that polar water is continually finding its way from the depths of the polar basins along the floor of the great oceanic areas, so as to reach or even to cross the equator. And as no such deep efflux could continue to take place without a corresponding in-draught to replace it, a general circulation must be assumed to take place between the polar and equatorial areas, as was long since predicted by Pouillet.—*Nature.*

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TELEGRAPHIC RELIGIOUS SERVICE.

A most interesting and unique religious observance was held a few days since in Westminster Abbey, for the especial benefit of the telegraph messenger boys of London. It was conducted under the direction of Dean Stanley. There were present nearly seven hundred of those humble servants of the telegraph, all dressed in the uniform peculiar to their avocation. The Dean preached one of his most eloquent sermons, appealing directly to the understandings of his auditors, and adapting his disconrse to their peculiar wants.

The boys seemed to fully appreciate both the attention paid to them and the admonitions of the Dean. The service was the talk of London for a day. The old Abbey has witnessed many splendid ceremonials, but none which was more impressive and apparently beneficial than this.

OBITUARY RESOLUTIONS.

A meeting of Telegraph Operators of Auburn, N. Y., and on the line of the New York Central Railroad, was held in this city, July 11th, 1871. W. L. Ives of Seneca Falls, presiding. After some appropriate remarks by the chairman relative to the death of Burdett N. Foote, who died in Auburn July 9, of typhoid fever, the following resolutions were adopted :

Whereas, It has pleased Divine Providence to take from our midst our friend and fellow operator Burdett N. Foote; and

Whereas, In his death we feel that we have lost an earnest and devoted friend and co-laborer who had endeared himself to us by most affectionate ties; therefore be it

Resolved, That we deeply deplore this sudden and unexpected loss of our friend and brother.

Resolved, That while we feel that we cannot be separated from him, we should not murmur at the dealings of Him who ruleth over us and doeth all things well.

Resolved, That, as death makes no distinction but reaps its harvest at the calling of Him who holds the destinies of man at will, we should take warning from the sudden bereavement that has fallen so heavily upon the afflicted family and large circle of associates and friends that at the command of the Master's summons, we may be ready to obey.

Resolved, That we extend to the family and friends of the deceased, our heartfelt sympathies in this sad hour of affliction.

Resolved, That a copy of these resolutions be presented to the family of our deceased brother.

E. H. RICE, }
A. FOX, } Committee.
TOM A. GRAHAM. }

Mr. Foote was in charge of the Western Union Tel. Co.'s office at that place, having but recently learned the art of telegraphy in Auburn, under the instruction of Mr. Tom A. Graham, and afterward being connected with the N. Y. Central office. Previous to this he was with Messrs. Brown & Lee, at their store on Genesee street. He had the respect and esteem of all, and his loss will be mourned by many.

The funeral will be attended to-morrow by the Willard Guard, of which organization he was a member, at the residence of the father, and the remains will be taken to Skaneateles for interment. Many telegraphers from the Western Union line will also be present to pay the last sad respects to the memory of their lamented associate.—*Exchange.*

◆

WHAT THE MICROSCOPE REVEALS—WITH A MORAL.

Lewenboeck tells us of an insect seen with the microscope of which twenty-seven million would only equal a mite.

Insects of various kinds may be seen in the cavities of a grain of sand.

Mould is a forest of beautiful trees, with the branches, leaves and fruit.

Butterflies are fully feathered.

Hairs are hollow tubes.

The surface of our bodies is covered with scales like a fish ; a single grain of sand would cover one hundred and fifty of these scales, and yet a scale covers five hundred pores. Through these norrow openings the sweat forces itself like water through a sieve.

The mites make five hundred steps a second.

Each drop of stagnant water contains a world of animated beings, swimming with as much liberty as whales in the sea.

Each leaf has a colony of insects grazing on it, like cows on a meadow.

Moral : Have some care as to the air you breathe, the food you eat, and the water you drink.—*Hearth and Home.*

THE "VICTORIA STONE."

A new artificial stone, invented by Rev. H. Highton, is described by *Engineering:*

"The process of manufacture consists in mixing broken granite with hydraulic cement and steeping the whole when set in a solution of silica. Two kinds of granite are used, Mount Sorrel and Guernsey. This is broken up into small fragments on the works. It is then mixed with Portland cement in the proportions of four of granite to one of cement, sufficient water being added to render it of a pasty consistency. In this state it is filled into the moulding frames, and allowed to stand for four days to dry. It is then taken from the mould and placed in a solution of silicate of soda, where it remains for two days, when it is ready for the market. * * The material when produced is known as the Victoria stone, or petrified concrete, and the objects moulded from it are flagging, sinks, mantel-pieces, coping, and capstones, sills, stairs, and such like articles. It is not so applicable for finely cut mouldings. * * A slab of the concrete two feet wide and two inches thick, resting loosely on supports two feet apart, will bear in ten days time an average weight of 700 pounds in the centre. After having been steeped in the silicate bath, it will sustain more than 1,000 pounds, whilst in five months it will carry 1,700 pounds, and in nine months 2,400 pounds. The crushing strength was found by Mr. Kirkaldy to be 6,441 pounds per square inch. A block presenting a surface of six inches by nine inches, sustained a weight of nearly 160 tons. At a London brewery it has been laid to replace ordinary paving which was constantly being broken by the rough handling of barrels. Since the Victoria stone has been laid, not one slab has been broken."

◆

SUBTERRANEAN ELECTRICAL DISTURBANCES.

A few minutes before and after the earthquakes of the 17th March last, says *Nature*, powerful positive electrical currents were rushing towards England through the two Anglo-American telegraph cables, which are broken near Trinity Bay, Newfoundland. Mr. C. F. Varley, C.E., who informed us of the fact, broaches the novel speculation that some earthquakes may be due to subterranean lightning. He imagines that as the hot centre of the earth is approached, a layer of hot dried rock may be found which is an insulator, while the red hot mass lower down is a conductor. If this conjecture be true—and there is plausibility in it—then the world itself is an enormous Leyden jar, which only requires charging to a very moderate degree to be equal to the production of terrific explosive discharges.

The French Atlantic cable was disturbed at the same time, and so were many of the English land lines, but the only observations as to the direction of the current were made by means of the Anglo-American telegraph cables.

A number of Mr. Varley's charts about earth currents were published in the Government Blue Book of 1859–60, showing that the direction of these currents across England was in a very notable degree determined by the contour of the coast, and that the same auroral discharges would often produce currents at right angles to each other in direction, in different parts of Britain.

◆

The great telegraphic feat of direct communication between England and India, without any re-transmission, has just been accomplished by the transmission of a message from Kurachee to London, which was the first message sent from India to England instantaneously. The distance by the Indo-European line is 6,000 miles. Communication is now open direct between Bombay and London.

THE POETRY OF TELEGRAPHY.

[Written for the Journal of the Telegraph.]

There is scarcely any labor that may not be lifted out of the sphere of mere drudgery into something noble and divine, if you but bring to it the right kind of effort. It is the mission of the poetic element, not to stand aside existing only for itself, but to enter into common things, refining and beautifying them.

It is especially true of the telegrapher's work, that whether it becomes a weary routine to be dragged through year by year, or whether it conduces to his own spiritual advancement, depends entirely on himself. The great mass of operators are brought in contact with the public and have frequent opportunities to throw themselves into sympathy with humanity and to study life in many phases. Nor is it "unbusiness-like" to do so. A business-like demeanor is not a surly one, as many seem to think. The first requisite to business success is popularity, and since you must have some speech with customers, business is as quickly transacted in an amiable tone as in a surly one. What lifts our vocation out of narrowness and mere mechanical labor and widens it out into a kindly influence and brings it into relation with all great interests, is what I may call its poetry, or the part which sympathy and imagination play in it. Let me illustrate.

In cities, various forms of imposture have made men over careful in matters of charity. A stranger within our gates, set upon by thieves, or perplexed in any other way, knows better than to expect to find any good samaritan who will believe his story, or lend a helping hand. Coldly their eyes pass over him; they pass by on the other side. He utters his trouble to no one, but, perhaps, heartsick and despondent, tries what the telegraph will do to notify his friends of his case. There he, perhaps, finds one whose nature and delight it is to sympathize with all human experiences, one who has kept his heart warm and his sympathies keen. A glance or a tone encourages him to tell something of his story, and he goes away with his burden lightened, and you are in no wise worse for listening, but rather better for having exercised the best side of your nature. Every day you are taught to feel that human nature is one vast brotherhood;—that, in spite of all that tends to divide, there is far more that brings men together;—that pain, and sorrow, and joy must always touch the heart, and thrill the one great chord which binds us to humanity. Or, the father comes to telegraph the death of the dear child; he is tremulous with grief; usually cold and hard in exterior, he is unmanned now. How sweet the ministering, how divine your mission, if you are able to comprehend his feelings, to jar with no rude touch his aching heart, but by a reverent tone to soothe him with the consciousness that all men, even strangers, acknowledge kinship in sorrow. Or the emigrant comes to you, alone in a foreign land, lonely, homesick, anxious, in an agony of absurd expression which would convulse you with laughter if it were not so pitiable. Be patient with him; smile upon him with your kindest expression,—all men understand *that* language,—and how his faint heart will grow brave and he will remember as long as he lives the first kind face he saw in the strange country.

And the child comes to telegraph to her mother,—the poor old mother far off in some little country homestead, waiting and watching with dim eyes,—and after the address the daughter writes, "Dear mother, your child will be with you to-night." Oh, the yearning in those nine words! How touching is that "Dear mother," how pathetic that "your child!" She feels, grown woman though she be and burdened with life, that she has still a refuge, a home "where mother is," and she knows the dear old lady would not understand the cold formula of the telegram, and her tenderness overflows in "Dear mother." You feel all this at one flash of thought, and as you read it your thought vibrates in your tones and she looks up into your face and says, with happy trust in your sure sympathy, "I have come four thousand miles to see my mother, and she has been looking for me for weeks!" Ah, in that moment, do you not see all barriers melt away, and does not heart meet heart in a feeling of heavenly tenderness and purity? It is well worth your while to catch these sweet though fleeting glimpses of those things which âre eternal with the soul, and to feel in these divine moments that worldliness is but a thin crust after all, and affection and trust underlie all things forever. As you flash that message along the wire, you follow it in imagination, and see the aged woman sitting by her "south window" maybe, knitting with tremulous hands and watching the farthest spot of road through the trees where she can first see the stage-coach. How her old weary heart throbs again with the hot blood of early youth when she sees it take the turning towards her door! She runs with trembling steps to meet it; but ah, she turns aside again to shed her joyful tears! Does not your heart share her joy? Are you not paid tenfold for that message when you think of that glad reunion? If it be possible for you to feel thus, every day will bring you deep and beautiful experiences and your work will lift you into heavenly places.

Nor have I mentioned all the interests with which you will come in contact. You will be close to the heart of things; all the most sacred emotions of life flow sooner or later through your office. The end of life and its beginning, the bitterness of woe and the heights of joy will pass before you. You will send tidings of the little life just entered upon the scene around which cloister what fond and anxious hopes, awaiting which are what dangers and what delights, and from which will go forth what strong and far-reaching influences.

Thus you gather around you all which constitutes life. You make long arms and reach out in an ever widening sphere. It becomes impossible for you to grow narrow and petty in your instincts. Your vocation becomes a great one to you; you enter into it heart and soul; you regard it with enthusiasm. It is your ambition to extend it and you cease to look at it as labor is too apt to look at capital, with wary eyes, as at an enemy. You, as the representative of labor, are no longer set over against capital, but it becomes your coadjutor, subserves your purpose, and gives you with your employment what it never can withdraw, viz., active sympathies, generosity, experience in life. You then see that capital, strive as it may to exist for itself, really does exist for you, for humanity, for progress. It is the means to an end for which you too are striving, and your share of the work is to make as perfect as possible the labor which it falls to you to perform.

Boston, Mass. OPERATOR.

◆

IN THE SLIDES.

S. Ebbs, a telegraph boy in the employ of the Montreal Telegraph Company, on his return from Hull to the company's office, after delivering some important despatches at Hull, stopped at the head of the Chaudiere Slides, thinking to have an easy ride down to the city by jumping on one of the passing cribs of square timber; when, by some mischance, he slipped into the powerful current, which instantly whirled him away like a straw. A comrade, named Andrew Jones, in the employ of the same company, stationed at the Chaudiere, with extraordinary pluck, plunged into the stream with the vain hope of rescuing his drowning friend. In the water the two appeared to grasp each other, and a struggle for life seemed to ensue, but the efforts of the despairing youths, now swept on by the irresistible force of the stream, which increases in velocity with every foot, were fruitless, and they were tossed and hurried on till they at length lost all consciousness; sometimes on the face of the water, sometimes hurled forward over the almost visible planking, at the rate of twenty miles an hour, they shot over not less than three pitches. When the extraordinary velocity of the volume of water which pours over these pitches, and their depth, are considered, it is marvellous that the lads were not dashed to pieces. As it was, their light bodies were tossed about, sometimes almost thrown out of the stream by the speed by which they were urged forward over the pitches, in a frightful manner. The most perilous part of the adventure was that close behind them came a large crib of square timber, pursuing them like relentless fate, gaining on them with every few feet, and the progress of which no human person could arrest. The boys say that they tried, once or twice, to speak, but could not, their mouths being filled instantly with water; they were in no pain, and their feeling was, on the contrary, one of deep rest and happiness; like a foretaste of heaven. How it happened that they were rescued, neither they nor their rescuers can say. It was like a dream. Some men at the foot of the slides saw something like a human form come rushing down. Instinctively they prepared to reach out for it, and did so.

There were the two lads, clasped to each other's bosoms, death-like and insensible, but saved.

To-day the lads are well, but dreadfully stiff and sore. If they had been carried over the next pitch, into the heavier water, they must inevitably have perished.

All the young lads were afraid of, as soon as they became conscious was, that they would be reprimanded, and the first thought of Ebbs was whether his delivery book was safe. The poor little fellow skulked into the office as though he had committed a crime, but when the truth was made known the hearty kindness of his superior officers speedily removed his apprehensions.—*Ottawa Free Press.*

◆

To the Editor of the Journal of the Telegraph:

Will you please give, through the columns of your paper, the correct check to enclosed message, and oblige,

Yours, very respectfully, W. S. TAYLOR.
LAKE VILLAGE, N. H.

JAMES B. FRANCIS—
Lowell, Mass.:
Twenty two hundred and sixty seven (2267).
J. B. FRENCH.

Answer.—Eleven words. Where figures are inserted in addition to the words expressing them, the charge is as if the words had been twice written. In this case the word "and" not being expressive of a figure, is charged but once.

◆

SPEAKING of our friend John W. Fuller, formerly manager at Oswego, and who resigned that post to conduct the Oswego *Press*, that paper says:

> His return to telegraphing indicates no abatement of interest on his part in the *Press*, no abatement of esteem on the part of the *Press* toward him. The *Press*, indeed, would be something more than ungrateful could it ever forget the conscientious and untiring fidelity with which Mr. Fuller worked for it during that period always so trying to new journals—the first year. To him more than to any other man does the paper owe its success. Always enthusiastic and energetic, his whole heart was in this enterprise, and he worked for it as few men could have worked and fewer still would.

Mr. Fuller is now settled in his old vocation at Newark, N. J., pursuing his duties with his usual ardor and fidelity.

THE SERVICE.

WESTERN UNION TELEGRAPH COMPANY

EASTERN DIVISION.

APPOINTMENTS.

W. Blackham	operator	145 Broadway, N. Y.
H. C. Coffin	"	Appleton's, Williamsburg.
J. B. Hurd	"	145 Broadway, N. Y.
Miss Lucy J. Judge	"	"
N. H. Monk	"	"
Miss Lizzie T. Moore	"	"
Gilbert Morris	"	Gold Room, New York.
A. Sprague	"	145 Broadway, N. Y.
W. Ziegerfu	"	"
Miss M. McDonald	"	Mahone Bay, N. S.
Chas. Hobon	"	McAdam, N. B.
Suel Smith	"	Portland, Me.
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G. W. White	"	Groat's Corner, Mass.
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W. H. Richardson	"	Lebanon, N. H.
L. G. Bagley	"	St. Johnsbury, Vt.
N. G. Chipman	"	Wallingford, Vt.
H. B. Mason	"	West Andover, N. H.
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Miss Isle White	"	Garrison's, N. Y.
W. H. Ellis	"	Pawling, N. Y.
John A. Simonds	manager	Farmer, N. Y.
W. W. Killip	"	Geneseo, N. Y.
Jas. S. English	operator	Niagara Falls, N. Y.
T. J. McGarr	"	Utica, N. Y.
Geo. Mahle	"	Baltimore, Md.
L. M. Foley	"	Hyde Park, Pa.
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C. R. Norneo	"	Philadelphia, Pa.
H. J. Maynard	"	"
Thos. H. O. Neal	"	"
Jno. E. O'Brien	"	Phillipsburg, N. J.
Albert Watson	"	Princess Anne, Md.
I. B. Newhart	"	Slatington, Pa.
I. I. Dolphin	"	Swarthmore, Pa.
W. D. Miller	"	Westover, Md.
J. B. McCall	"	Jersey City, N. J.
Geo. F. Clark	"	Owego, N. Y.
D. M. Sharpnack	"	Petroleum, W. Va.

RESIGNATIONS.

W. P. Trites	145 Broadway, N. Y.
G. W. Kilby	Dennysville, Me.
B. D. Farnham	Sabattus, Me.
F. W. Dergin	East Andover, N. H.
J. R. Hunt	Hoosac Tunnel, Mass.
E. N. Freeman	Hudson, Mass.
J. Mace	Lebanon, N. H.
C. H. Bagley	St. Johnsbury, Vt.
J. A. Pooler	Wallingford, Vt.
A. W. Huntress	West Andover, N. H.
Miss A. F. Imlay	Hinsdale, Mass.
Miss E. V. Waters	Stockbridge, Mass.
A. G. Rider	Taunton, Mass.
E. L. Bugbee	Boston, Mass.
Ira S. Kinch	Farmer, N. Y.
H. G. Baker	Geneseo, N. Y.
N. H. Monck	Utica, N. Y.
B. A. Fulmer	L. & B. Junc., Pa.
C. W. Rothrock	Slatington, Pa.
W. J. Hamilton	Port Johnson, N. J.
Robt. H. Smith	Baltimore, Md.
J. M. Alter	Perryville, Pa.
Asa Davis	Jersey City, N. J.
F. R. Beltz	Petroleum, W. Va.

◆

At the inauguration of the statue the work upon it was very incomplete, no time having been taken to perfect the joints, or to tone down the bright brassy look which metals fresh from the moulds and hammer always exhibit. Nothing but a desire to meet a pressure for its inauguration at the date named, so as to prevent postponement, could have induced its erection at the time. The statue is now undergoing this necessary work, and the name is, at the same time, being engraved upon the granite.

THE MORSE RECEPTION.

Amount of deficit July 15 .... $116 24

CASH RECEIPTS.

Ada Carson, Philadelphia	$1 00	
J. J. Harris, Kit Carson, Col	1 00	
W. H. Wendle, New York	1 00	
C. R. Wallace, Shelbyville, Tenn	1 00	
H. S. Wadsworth, Morley, Mo	1 00	
James Hough, Kankakee, Ill	1 00	
Hattie Hough, Kankakee, Ill	1 00	
W. Hamaker, Lebanon, Pa	1 00	
O. A. Putnam, Elmira, N. Y.	1 00	
E. F. Ludwig, N. York	1 00	
G. W. Mitchell, painter, 49 Warren st., N. Y.	5 00	
W. McMullin, Bedford, Pa	1 00	
Scott E. Pope, Chapman Creek, Ks	1 00	
Danetoe Wilson, Greenwood, Ind	1 00	
J. L. Hall, Lehigh Summit, Pa	1 00	
E. Curry, Kenosha, Wis	1 00	
S. B. Wright, Beaufort, S. C.	1 00	
W. Union Office, Hellertown, Pa	3 00	
M. S. Palmer, Elmira, N. Y.	1 00	
Sweet Chalybeate Springs, Va	2 00	
O. A. Dodge, banker, N. York	90 24	$116 24

So the whole expenses are paid. We append the note by which Mr. Dodge so handsomely closed the account and wiped out the debt:

Office of Dodge & Moore,
Bankers and Brokers,
No. 74 Broadway, New York, July 26th, 1871.

J. D. Reid, Esq.,

Dear Sir:—I claim to be a "sound" operator—formerly, and for nearly twenty years—of the "Morse" persuasion. You may remember me as such.

By virtue of that claim, may I not be permitted to "corner" the Morse Statue stock—which, I am informed, may be done with the amount of enclosed check? Check enclosed, $90.24.

Yours truly,
O. A. DODGE.

Thus in gladness and liberality and unanimity unprecedented closes a noble work, which has made the operators of the continent one in heart. So may it ever be.

◆

Resigned.—Mr. Leonard Read, who has been manager of the telegraph office in Rutland, Vt., for the past fourteen years, has resigned that position, on account of the failing health of his father. Mr. Read will take charge of the farm on which his father resides at De Ramsay, Province of Quebec.

During Mr. Read's residence in this place, he has gained many warm friends by his prompt and efficient discharge of the duties of his position, and his uniform courtesy and urbanity of manner. As a legible, accurate and painstaking telegraphic operator, he has few equals.

The Herald has been brought in peculiarly intimate relations with Mr. Read by his frequent assumption of the duties of night operator in receiving the press dispatches, and the remarkable correctness and legibility of his reports have met the warmest appreciation of all connected with this journal. As a citizen he has enjoyed the confidence and respect of the entire community for his sterling qualities of character, and in his departure our village has lost one of its truly useful and estimable citizens.

Mr. E. G. Mason, who has been an operator in the telegraph office, with a short interruption, for the past seven years, has accepted the position of manager. Mr. Mason has proved his competency for the position by his efficient and faithful discharge of the subordinate duties of the office, and in his new position will undoubtedly give entire satisfaction.—*Rutland Herald.*

◆

Russia has given her adhesion to the International Telegraph Convention of Vienna. This brings the Russian lines to the Amoor and the Dead Sea under the terms of the Convention.

RESPONSES TO "THAT KISS."

Rochester, N. Y., July 20, 1871.

Dear Sir: Journal of 15th just reached me.

Speaking of kissing reminds me of a letter this week received from an old lady who has seen your paper. Though no telegrapher herself, she has a son who is, and in all that concerns and interests *her boy*, (though he was a boy of large growth when he entered the profession, twenty years since,) she is as much interested as when he was on her knee.

The kisses of these pretty girls, though all right and sweet enough, are but froth compared with those of a good old mother. Her kiss means something. No art or formality about it. Her boy feels the love of a pure heart in that kiss.

You and she will probably never meet again, but she modestly suggested that she loved you and liked your speech, and in this connection, as the latter gave full liberty, said she was more than willing to do her full duty to balance the kissing account.

Yours truly, C.

Dear Sir: No one could have been chosen to speak to Father Morse for us, who would have anticipated our wishes as you did; and to ask you to accept many thanks for the kiss you gave him for us, is not the only way I would like to express my gratitude, but being so far away, I can only tell you the kiss is enclosed. Please accept it with sincere regard for yourself and the whole Telegraphic fraternity from

Mary E. Hoffer, Opr., Mount Joy, Pa.

Dear Sir: In ancient times we read of "kissing through the wall," but I fear even Thisbe would have been daunted by *three hundred* miles of distance. If you can overcome this difficulty look out for a payment of your bill in the next eastern breeze, and credit the same to

"Mollie."

N. B. Please consider this *my* lightning arrester.

M. L. Bemris, Manager, Quincy, Mass. Ofs.

New York, July 19th, 1871.

Dear Sir: Having been an eye witness at the Academy of Music on the evening of June 10th, I now take the liberty of returning my sincere thanks and grateful acknowledgment to you with that Kiss, which you gave so affectionately for me.

Hoping none of my "Morse Sisters" will be in the least bashful in proffering an acknowledgment to so just a claim,

I remain yours truly, "73",
Lizzie M. Noble,
Operator, 145 Broadway, N. Y.

◆

THE MORSE TESTIMONIAL.

To few men is it given to wear the crown which their life struggle has fairly earned. Few inventors receive from an ungrudging world a full acknowledgement of their genius and a grateful return for their service to mankind. But to one man all this has come in our time; indeed, it happened but yesterday. An old man—a genius—whose invention had revolutionized the commercial and social interchanges of the world, stood among a vast concourse of those for whom he had created an industry, and with plaudits and music, and banners and flowers and eloquent voices, received his crown. The young maiden who dictated the first message: "What hath God wrought!" had had only time to become a young matron meanwhile, and sat with moistened eyes to witness the triumph of her old friend. How fitting the response to this first message in the words: "Glory to God in the Highest: on earth peace, good-will to men." It all reads like a poem, because the story of a great life is rounded, and justice is done to genius and to toil; and an age that has had much said against it, and a country prone to forgetfulness, have vindicated their claim to respect. Blessings on the old man, and on the land that thus rewards him! —*Scribner's Monthly.*

Journal of the Telegraph.

This Journal is issued on the 1st and 15th of each month. Its circulation is 6,500. It goes to every State, Territory, and Province on the continent. It is fast becoming a necessity, and is already welcomed as a friend. No better medium for advertising exists.

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JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, AUGUST 1, 1871.

ANCIENT ART AND MODERN DISCOVERY.

It tends much to limit the eclat which attends modern discoveries and inventions, the knowledge which every now and then comes to us of the skill and knowledge of centuries now past. The earth has swallowed up and hidden for ever much of the evidence of ancient art, but enough remains or has been rescued from its tomb to show how bright was the genius and how refined the tastes of the men who lived at a time so distant as to be regarded as barbaric.

Here, for example, in Humboldt's great work, "Cosmos," we have the evidence that one thousand years before our era, the Chinese had magnetic carriages on the principle of the mariner's compass to guide them across the great plains of Tartary. It is well known that the temple of Solomon was constructed in such a way that its towers acted the essential part of lightning rods on the principles of the most recent requisitions for safety. So of the steam engine, which finds its first prototype in the œolipyle of Hero of Alexandria, ages ago. So also of printing, for it has been well ascertained that the Romans used movable types to mark their pottery and endorse their books. In the ruins of Nineveh a magnifying lens of rock crystal was found, which one of the most noted of Scotch scientists regards as a true optical lens and the origin of the microscope. Even the stereoscope, invented by Professor Wheatstone, of England, a year or two ago, was known to Euclid, was minutely described by Galen fifteen hundred years ago, and still more completely in the works of Baptista Porta in the year 1599. And the science of photography, originating apparently in the discoveries of Daguerre, and first made known to the European Academy of Sciences in 1839, has been found clearly described by M. Jobard in his *Nouvelles Inventions aux Expositions Universelles*, 1857, taken from a translation from the German three hundred years old. In 1774 the rays of the sun were used to write on glass, and in 1802 an account is published of a method of copying paintings on glass and of making profiles, by the agency of light, upon nitrate of silver.

And so it has been of the Telegraph itself. For a hundred years and more it has been occupying the thoughts of men. As long ago as 1798 we find a mechanic corresponding by a wire and electrometer with his wife in a distant apartment, and even in the wilds of Africa sound signals uttered from great distances were easily translatable into language.

All these facts prove the correctness of what Prof. Morse so properly acknowledged in his reception address, that the merit of discovery is seldom due to a single mind. It is the result of cumulative thought. But the man whom the world honors is not the dreamer who guesses at coming gifts from science to mankind, not even those who first detect new powers capable of being harnessed to the world's industries, but to him who, with faculties for combination, skilfully clusters the thoughts fermenting in other minds, and constructs an implement to place in the hands of labor for the good of all. Fame demands something done before she will put a laurel upon any brow; and notwithstanding all that may be said to the contrary of the world's ingratitude, genuine and lasting honor will finally rest on the head of him who has conferred a practical benefit on his race.

◆

IRON POLES.

In our last number we published an article from the Central City Register of Colorado respecting iron telegraph poles. In the same issue we gave a sentiment from Supt. Clowry of St. Louis, designed for the occasion of the Morse reception, pledging Missouri to supply the iron poles of the future lines. Both spoke from the feeling of a common want, a want apparently to be met with in no other way unless by the construction of subterranean conductors.

Experience has shown that over large tracts of the western territories, telegraph lines are daily exposed, at certain seasons of the year, to destruction from lightning. Certain circuits are, from this cause, interrupted to such an extent that they cannot be relied upon. A dozen or a hundred poles are shattered at a stroke, and a day is lost before connection can be restored. When telegraphic connection is first established and given to a people, irregularity is endurable, and patiently borne. But when attainable means of securing permanent intercourse with "the rest of mankind" begin to exhibit themselves, patience, having had her "perfect work," very properly demands release. So we have before us a cry from the western plains for help, and in a direction where the means of supply seem abundant. The State of Missouri says to us, "my mountains are full of iron; your telegraph lines are shivered daily by bolts of lightning; I am exposed to isolation from my Pacific sisters; mould my iron into poles and plant them along the roads where the lightning reigns and make a highway which shall be for ever."

Now if this be the solution, there is wanted a design for an iron structure, and estimates of its cost. Many years ago we obtained such estimates, and published an article illustrated by a sketch of an iron telegraph pole, on which, curiously enough, was engraved the words "Pacific Telegraph." This was in 1853 That design embraced—

1. A foundation of stone, a single block five feet long and a foot square planted firmly in the earth.

2. A neatly moulded iron pole twelve feet high, terminating in a receptacle into which could be placed a wooden frame for the insertion of the insulators, and which could be removed for cleansing or repair at pleasure. This iron pole to be planted on the stone basis.

At that time such a line could have been provided at comparatively low rates, and the idea took possession of us as a future work when, telegraph contractors being all well buried and happy, the pole had to be as permanent as the rail. That time seems to be coming. We invite attention to it. The foundation need not be stone. The top need not be wood, although we would suppose it best. Let us see whether, in some simple style, in which taste and utility may blend, an iron highway can be provided over our western territories to render communication at all times perfect and reliable.

We notice that Supt. Tubbs has adopted the Varley plan of running a wire from the top of the poles on his exposed lines to the earth, to save them from destruction by lightning, with successful results.

◆

Nothing can more clearly exhibit the narrow condition of telegraphic provision in England before the government assumed control, and the stinted provision of facilities granted, than the following statements made public recently in the London *Mechanics' Magazine*.

"Of all the messages handed in for transmission at the following cities, the per centage received at offices recently opened for public convenience, was:

In Glasgow	9	per cent.
Edinburgh	11	"
Birmingham	14	"
Leeds	17	"
Liverpool	26	"
Manchester	40	"

◆

Advices have been received from the West Indies that the cables to the Islands of Guadaloupe, Dominica, and Martinique have been successfully laid, thus placing the Islands of Porto Rico, St. Thomas, St. Kitts, Antigua, Guadaloupe, Dominica, and Martinique in direct telegraphic communication with each other. Messages may now be forwarded to any of these colonies, by telegraph to Jamaica, thence by mail to St. Thomas, and telegraphed to their destination.

◆

BENEFITS OF LAUGHTER.—Probably there is not the remotest corner or little inlet of the minute blood vessels of the body that does not feel some wavelet from the great convulsion produced by hearty laughter shaking the central man. The blood moves more lively—probably its chemical, electric or vital condition is distinctly modified—it conveys a different impression to all the organs of the body, as it visits them on that particular mystic journey, when the man is laughing, from what it does at other times. And thus it is that a good laugh lengthens a man's life by conveying a distinct and additional stimulus to the vital forces. The time may come when physicians, attending more closely than they do now to the innumerable subtle influences which the soul exerts upon its tenement of clay, shall prescribe to a torpid patient, "so many peals of laughter, to be undergone at such and such a time," just as they do that far more objectionable prescription—a pill or an electric or galvanic shock.

HOW TO COLLECT A KISS.

There's a jolly Saxon proverb,
  And it's pretty much like this,
That a man is half in heaven
  When he has a woman's kiss.
But there's danger in denying,
  And the sweetness may forsake it,
So, I tell you, bashful lover,
  If you want a kiss,
      Why, take it.

Never let another fellow
  Steal a march on you in this,
Never let a laughing maiden
  See you spoiling for a kiss.
There's a royal way to kissing,
  And the jolly one's who make it
Have a motto that is winning,
  If you want a kiss,
      Why, take it.

Any fool may face a cannon,
  Any booby wear a crown;
But a man must win a woman
  If he'd have her for his own.
Would you have the golden apple,
  You must find the tree and shake it,
And if the thing is worth the having,
  And you want a kiss,
      Why, take it.

Who would burn upon a desert
  With a forest smiling by?
Who would give his sunny summer
  For a bleak and wintry sky?
Oh! I tell you there is magic,
  And you cannot, cannot break it,
For the sweetest part of living
  Is to want a kiss,
      And take it.

New York, July 19, 1871. L. M. Noble.

The above looks very like a challenge.

◆

The Federal Government, by R. H. Gillet, formerly Solicitor of the United States Treasury Department, published by Woolworth, Ainsworth & Co., 53 John St., N. Y.

This volume has been sent us by the publishers. It is a handsome duodecimo of 440 pages, and of faultless typography. Its design is clearly expressed in the introduction. "It is not designed to give minute information to all who hold public office. Its object is to enable the rising generation to understand the structure of our government; what officers are employed in its practical operation, and their general duties. Such knowledge will be highly useful to all, and especially to the American citizen when giving direction to our public affairs. Without knowing what the constitution and laws authorise and require, he cannot give instruction to those intrusted with power, or determine whether they have been faithful to the trusts committed to them."

◆

We are glad to see it announced that Hugh Allan, Esq., President of the Montreal and Liverpool Steamship Co., as well as of the Montreal Telegraph Co., has been knighted. On no shoulder could the sword which confers knighthood have fallen more worthily. We said this a year ago. It was a prophecy we are pleased to see fulfilled.

◆

A bad marriage is like an electric machine: it makes you dance, but you can't let go.

◆

The danger of the scissoring process is made laughably evident in the following, which we find in the Brooklyn *Eagle:*

"Some years since I made the discovery that when hydrogen gas was treated by simple contact with turpentine, it was rendered highly luminous without any perceptible waste of the turpentine.

"An engine on this principle has been in constant operation for eight months, running nine hours per day, doing a duty of 67,000 foot pounds, at an expense of three ounces zinc per day of nine hours."—*H. M. Paine.*

Mr. Paine will be surprised to find his motor running by turpentine.

◆

A temperance lecturer, descanting on the superior virtues of cold water, remarked: "When the world had become so corrupt that the Lord could do nothing with it, he was obliged to give it a thorough sousing in cold water." "Yes," replied a toper present, "but it killed every critter on the face of the earth."

AFRAID OF THE TELEGRAPH.

Col. Knox in his admirable work "Overland through Asia," has the following:

In civilized, semi-civilized, and barbarous nations, people have the same disposition to ascribe any effects, the causes of which they cannot understand, to supernatural agencies. The Chinese have great faith in the power of devils, among whom they include all foreigners. A line of telegraph about 50 miles long was lately constructed near Shanghai, and after puzzling their brains over the manner in which messages were transmitted, the Chinamen finally came to the conclusion that they were carried along the wires by devils in the employ of the foreign barbarians. To this they made no special objection, until a Chinaman chanced to die suddenly in a house which stood near one of the telegraph poles. It then occurred to a native genius that one of the devils had come down from the wire and killed the man; whereupon his compatriots gathered together and demolished the line in very quick order.

• ◆ •

The progress of population westward is well illustrated in the case of Mr. E. P. House, of Evans, Colorado, whose marriage notice, having been mislaid at the time of its reception, appears in the present issue.

Mr. House went from the War Department in Washington in the Fall of 1869, to a point on the great prairies of Colorado, where the town of Evans now stands, to open a telegraph station. A pole, at the foot of which was constructed a rude table; a relay, sounder, and key, were the entire appurtenances of the new station. Then a shanty was erected, which was the village of Evans, until the trackmen of the Denver Pacific road came from Cheyenne. Since then the farmer has come with his plough, and the shanty has become the beautiful city of Evans, recently enhanced in numbers and increased in size by the settlement of two colonies from Illinois and Massachusetts, and bidding fair to become a rival of Denver and Greeley.

• ◆ •

It is proper to say now, that when we asserted that the material of which the Morse Statue was composed was the richest known to the art, we had in our possession the formula of its composition. The following are the items furnished by the artist:

Pure copper	90	parts.
Pure tin	9	"
Pure zinc	1	"

These are said to be the elements of the highest class of bronze work, and render it exceedingly hard and durable.

The Statue, when unveiled, had an unpleasant metallic sheen, the result of its rapid passage from the hands of the workmen in an unfinished state. It is the habit of artists to remove this glare by acids, to hasten the toning process of time. In this case Mr. Pickett preferred to let time do all this, and for which he was willing to wait. A slight application, however, of the acid will be made, to relieve the unpleasant effects of a variable discoloration.

◆

Some wag in the British House of Commons declared recently that women's rights are men's lefts. The epigram has been answered by the riddle, Why is the female like the telegraph service? Answer: Because it is always in advance of the male (mail) intelligence.

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York.
August 1, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since July 15, the date of the last tariff order.

Managers are hereby required to enter these changes in their tariff book as soon after the receipt of the Journal *as possible.*

NEW OFFICES.

477 Chateau, Ind. Terr.
329 Cobden, Ill., re-opened.
98 Flemington, N. C.
375 Frenier, La., re-opened.
Golden City, Col. Tariff same as Central City, Col.
323 Gainesville, Ala., re-opened.
* Kingston Hill, R. I.
42 Leed's Point, N. J.
* Narragansett Pier, R. I.
140 Newton, Ks.
220 Northville, Mich.
127 Ogden, Ks.
436 Prescott, Adams Co., Iowa.
149 Peabody, Ks.
* Peacedale, R. I.
220 Plymouth, Mich.
130 Riceville, Pa.
42 Somer's Point, N. J.
352 West's, Miss.

SUMMER OFFICES RE-OPENED.

27 Bethlehem, N. H.
27 Crawford House, N. H.
27 Glen House, N. H.
23 Gorham, N. H.
20 Jackson, N. H.
27 Mt. Washington, N. H.
27 Mt. Washington Depot, N.H.
27 Profile House, N. H.
27 Twin Mountain House, N. H.
20 White Mountain House, N.H.

Business for Twin Mountain House, White Mountain House, and Mt. Washington Depot, N. H., should be checked to Crawford House, and Mt. Washington, N. H., to Glen House, N. H.

The tariff to or from the "Summer Offices," except Gorham and Jackson, in New Hampshire, named above, is 20 cents more than present rate by "square." Tariff to Gorham, "except from offices on direct circuit" with Gorham, will be 25 and 1 from Portland, Me., check Portland, Me.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Kingston Hill, R. I.,	30	2	Kingston, R. I.
Narragansett Pier, R. I.,	30	2	" "
Peacedale, R. I.,	25	2	" "
Arkona, Ont., Goodwood, Ont., Stouffville, Ont., Unionville, Ont., Gaspe, Que.,	30	2	Send and check via most direct route.

OFFICES CLOSED.

Americus, Miss.; Amelia C. H., Va.; Brichley, Miss.; Gainesville, Miss.; Lookout Mountain, Tenn.; Oakland Point, Cal.; Prior Creek, Ind. Terr.; Robinson, Ill.; Terry, Miss.; Whitesville, N. C., and Wolf River, Miss.

GENERAL INFORMATION.

"Half-rate" messages will hereafter be taken for, and received from, Union Springs, Ala.

Hereafter the "tariff for other lines" from Worcester, Mass., to Spencer, Mass., will be 25 and 2, and from Richmond, Va., to Alleghany, Va., 65 and 4.

Allerton, Iowa, is in square 417, not 415, as at first reported.

OFFICES HAVING "SPECIAL SHEET A,"

Will check Lackawanna and Bloomsburg Junction, Pa., at same as special rate to Pittston, Pa.

William Orton, *President.*

DEATH OF RICHARD W. MARRIOTT.

Dear Sir: Mr. Richard W. Marriott, city collector, New York city branch offices of the Western Union Telegraph Company, died July 27, at 7½ o'clock, A. M., aged forty years and twelve days. I have sent the following notice to all offices New York city:

To all Managers, Operators and Clerks:

"It is my painful dut to notify you of the death of Mr. R. W. "Marriott, late city collector, who by the faithful performance of "every duty and strict uprightness of character has obtained the "well earned esteem and respect of all. His funeral will take "place to-morrow, Saturday, at 3 P. M. Services at his residence, "Atlantic avenue, beyond the Howard House, East New York "L. I.

J. C. Hinchman, Supt."

Mr. Marriott was an employee of this company for many years, originally in charge of the Delivery at 21 Wall street; also in same capacity at 145 Broadway, when this office opened, and subsequently as city collector.

Very respectfully,

J. C. Hinchman, Supt.

Mr. Marriott was one of the earliest members of the Telegraphers' Mutual Insurance Association, and his death will make necessary Assessment Number 22. He leaves a wife and two estimable daughters, one of whom is in the service of the ladies' department, 145 Broadway, N. Y.

◆

Harlem, Mo., July 24, 1871.

Dear sir: I will, in the course of a few weeks, send you three or four applications for Insurance. *On this particular Line* I hope to see one thousand new appointments made soon of select, good, sober, and intelligent men, who, seeing its incalculable blessings, will stick there. From each month's salary I lay a small sum away for the future benefit of my family. From this sum I pay my assessments, for I know that such assessments are but bread cast upon waters to return even more than ten fold to bless those whom I shall have left behind when the father has called me and I go hence to "answer.

You and I are strangers, but I love you more as each number of the Journal reaches me. No operator can read the Journal twice a month, and not feel that he is a better man.

I am yours, very respectfully,

R. G. Fox.

It may seem indelicate to publish these personal notices. We do so to gratify the writer, and because, coming from strangers, they are grateful as assurances that our work is not in vain.

◆

South American Telegraphy.—A privilege for forty years has been granted to Messrs. Lamas for laying a submarine cable between Rio and Buenos Ayres. Buenos Ayres is now in electric communication with the remotest provinces of the Argentine Confederation; by the end of this year the Argentine Republic will probably be also enjoying telegraphic intercourse with Chili and the Pacific coast. The Banda Oriental Government has granted a concession of a line between Monte Video and Yaguadon in Rio Grande. The works of the Transandine telegraph have been commenced on the Chilian side of the Andes and are being pushed forward vigorously.

◆

A new fire-alarm cable, weighing four tons, constructed of the heaviest armor and strong enough to hold any vessel, so that it cannot be broken, has been successfully laid to East Boston. It contains five conductors, two of which are used for the fire alarm, and there are two extra. One will be used for the police telegraph.

TELEGRAPHERS' LIFE INSURANCE ASSOCIATION.

Assessment No. 22.

Occasioned by the death of R. H. Marriott, New York, July 27, 1871.

PAYMENTS RECEIVED.

2	39	44	64	140	188	206	213	254
271	286	316	323	332	340	353	380	441
463	464	500	526	652	660	563	564	600
615	626	63	630	710	716	722	741	809
858	859	917	923	932	930	943	968	990
1001	1006	1013	1014	1016	1024	1025	1090	1098
1099	1100	1101	1102	1103	1104	1116	1125	1126
1129	1134	1135	1136	1137	1130	1141	1143	1144
1145	1146	1147	1148	1150	1151	1152	1153	1164
1163	1173	1174						

The acknowledgment of remittances on No. 21 received since our last is necessarily postponed until August 15, on account of the excessive occupation of the Secretary in his ordinary duties. Be patient.

◆

A story is going the rounds, of an old colored man who was left in charge of a telegraph office in New Orleans while the operator went out to see a man. A call came over the wires, and Uncle Pete shouted as loud as he could—"De operator isn't yer!" The noise ceased instanter.

◆

Wire for Telegraph Conductors—J. B. Elkington.—Copper deposited from a solution by the aid of electricity is the most suitable material to employ, but it is found that in melting such copper its conducting power is liable to be impaired. The inventor produces telegraphic conducting wire from deposited copper without melting. He deposits from a sulphate or other solution of copper into a mould a plate of pure copper of about one-eighth of an inch in thickness. The plate he cuts into strips, which are drawn down in the ordinary way through dies into very thin wire. He then takes lengths of this wire and suspends them in depositing vats of suitable size (say about 7ft. deep,) and he allows them to remain in until they are from ¾ in. to 1 in. thick, when they are removed from the vat and drawn by rollers and dies into wire by the ordinary method.

◆

Waterproof Glue.—Ordinary glue can be rendered insoluble in water by adding to the water with which it is mixed, when required for use, a small quantity of bichromate of potash, and exposing the articles to which it is applied to the light. Chromic acid has the property of rendering glue and gelatine insoluble, and as the operation of heating the glue-pot is usually conducted in the light, no special exposure of the articles to which it is attached need be made. It is probable that paper could be rendered impervious to water by pasting the sheets with this prepared glue. The bichromate is said to render rubber particularly hard and unattackable by hot water. The chromated gelatine ought also to be tried on parchment paper, wood, leather, and cloth fabrics. The proportion of bichromate to be taken must be ascertained by experiment; for most purposes one-fiftieth of the amount of glue employed will be found to suffice—that is, one pound of dry bichromate of potash to fifty pounds of dry glue.

Many applications of waterproof glue will readily suggest themselves to our readers. The Albert photographic process is founded upon this property of gelatine, and billiard balls, buttons, and ornaments are now largely made of the chromated glue.—*Cabinetmaker.*

WANTED, IMMEDIATELY,

TEN LADY TELEGRAPH OPERATORS, who copy readily by sound; no others need apply. Address, by mail, C. H. Burr, General Manager of the Franklin Telegraph Company, Boston, Mass.

The cable destined to connect Guadaloupe, Dominique, and Martinique has been submerged with success.

◆

Wheatstone's Automatic Instrument.—This instrument, which is now being extensively employed in the Postal Telegraph Stations, consists of two parts. By one part, which is called a puncher or perforator, the signals representing the messages are punched out on a riband of paper. The punched riband is then passed through the other part, which is called the transmitter, which transmits the signals automatically and with unerring accuracy to the other end of the line. The transmitter can work up to 180 words per minute; but the punching, which is done by hand, rarely exceeds a rate of 40 words per minute. In order, therefore, to get the full value out of the instrument, by equalizing the speed of the punchers and writers with that of the transmitters, it is necessary to employ several punchers and writers to every transmitter, to punch the messages in batches, by several hands, and to divide the received riband amongst several writers.

◆

By certain chemical processes, the water of the celebrated Alum Springs of South Western Virginia, have been concentrated and moulded into pills, without any admixture with foreign elements. Mr. D. P. Sandoe, an old telegraph operator of Abingdon, Va., has been made agent for it, and he has undertaken to cure all dyspeptics and sufferers from vitiated constitutions by this natural product. If mineral waters can be thus provided, and their purity and properties retained, it will be a great boon to a great many people. The pills are used by dissolving in water. We wish Mr. Sandoe success.

◆

BORN.

On June 20th, 1871, unto J. F. Hartman, manager W. U. office at Alburtis, Pa., a son, making five in four years, all boys and No. 1 sounders.

On July 18th, 1871, unto T. F. Stevens, supply department, New York, a son.

On July 19th, unto E. R. Chase, manager, Maynard, Mass., office, a son, weight 4 lbs.

Note.—That must be a poney sounder.

MARRIED.

McMurchy—Rathbun.—June 28th, 1871, at the residence of Geo. A. Rathbun, Ridgway, Pa., by the Rev. J. A. Dooris, Rector of Grace Church, Mr. Alex. McMurchy to Miss Nellie A. Rathbun.

Bush—M'Millan.—At Franklin, on the 23d June, at the residence of the bride's father, by the Rev. R. W. Micou, Rector of St. Mary's Church, Mr. Wm. T. Bush to Miss Emma F. M'Millan, both of Franklin.

Bishop—Hoffman.—At the residence of the bride's sister, near Columbiana, O., June 13th, 1871, by the Rev. R. Cunningham, J. Bishop, manager W. U. telegraph office, Columbiana, O., to Miss Hattie Hoffman.

Miller—Mungar.—At Brooklyn, E. D., on July 23d, at the residence of the bride's parents, by the Rev. A. H. Partridge, of Christ Church, Thomas M. Miller to Anna, daughter of Warren Mungar, Esq., of Brooklyn, E. D. No cards.

House—Bishop.—May 9th, 1871, at Evans, Colorado, by the Rev. G. H. Adams, Edward P. House, manager W. U. Telegraph office, and railroad agent at Evans, to Miss Chat. A. Bishop, of Penn Yan, New York.

DEATHS.

Nightingale—At Dover, N. J., July 18th, of cholera infantum, Eddie B., infant son of Henry and Judith Nightingale, aged 1 year, 1 mo., 7 days.

Marriott—On Thursday, July 27th, at his residence at East New York, Mr. Richard W. Marriott, Collector of the Metropolitan District of the W. U. Telegraph Co.

Western Union Telegraph Company.

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A. B. Cornell. Augustus Schell. O. H. Palmer.

George Hart Mumford, *Secretary.*

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" 5—Charles F. Wood,	Boston, Mass.
" 6—A. B. Chandler,	New York.
" 7—S. B. Gifford,	Syracuse, N. Y.
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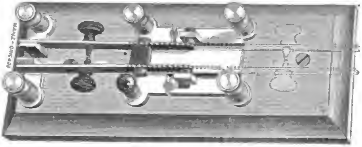

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☞ Our Morse Instruments are of the Western Union, Ottawa (or Caton) style.
We have ample facilities for the execution of every variety of electrical work.

SCREW GLASS INSULATORS AND BRACKETS,

Of the size and thread used by the Western Union Telegraph Company.

Having secured an Exclusive Agency for these Insulators, (manufactured under the Cauvet patent,) we are filling orders promptly for large or small quantities, at prices as low as any Insulator can be sold for in the market.

GRAY & BARTON,

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AND RESISTANCE COILS,

On the principle of the

WHEATSTONE BALANCE.

We have supplied a large number of these

INDISPENSABLE HELPS

Towards securing a good working telegraph line to various superintendents and operators, and can supply orders on short notice, as we keep the instruments in stock already finished.

Our Galvanometer is designed expressly for Telegraph Service—is light, portable, and easily handled.

GRAY & BARTON,

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WIRE IN BOND.

For the accommodation of the
SOUTH AMERICAN, CUBAN and MEXICAN TRADE,
we shall hereafter keep a stock of the Celebrated
"JOHNSON" WIRE,
both plain and Galvanized, in Bond, ready for shipment from New York.

PRICES AS FOLLOWS:

No. 9, Plain Annealed	4¼	cts. Gold.
No. 9, Galvanized	5¼	"
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This Brand of Wire is the best in the world, and has been adopted exclusively by the Western Union and many other Telegraph Companies.

We also continue to import this Wire for use in this country, notwithstanding the high rate of duty imposed by Congress in the interest of the monopolists. Any amount of it can be seen at our store at all times. The import duty on wire is now two cents per lb. gold, and 15 per cent. *ad valorem.*

L. G. TILLOTSON & CO.,
No. 8 Dey Street, New York,
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Sole Agents in the United States for "Johnson's" Wire.
Manufacturers of every description of
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They publish an Illustrated Descriptive Catalogue of their leading manufactures, to which they respectfully refer.

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A VERY FINE NEW STYLE

SMALL SOUNDERS,

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LEARNERS' INSTRUMENTS,

With Instructions,

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Best Quality and Improved Patterns of

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Kept constantly on hand,

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Materials for Private Telegraph Lines,

With instructions for putting up and operating.

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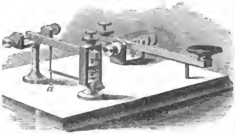
MECHANICAL TELEGRAPH INSTRUMENT,

PATENTED MAY 31st, 1870.



For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

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It can be placed anywhere, as it does not occupy a space more than six inches square.

Its cost is but $7, and there is no expense whatever to keep it constantly in working order.

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Special and liberal terms to manufacturers.

Remittances can be made by certified draft on New York, Cleveland, or Pittsburgh, money by express, charges paid, post office order, or registered letter at our risk.

Parties ordering instruments, from points except well-known cities, will please give the name of county and State.

Price, $7. Silver Plated, Extra Finish, $10.

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Telegraphers'
Mutual Life Insurance Association.

INCORPORATED UNDER THE LAWS OF THE STATE OF NEW YORK.

I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificate and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and the payment of dues.

XI. A meeting for the election of officers shall be held annually during the first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written request of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer.

Gerritt Smith, Secretary.
A. S. Brown,
W. H. Hill,
D. R. Downer,
Executive Committee.

DIRECTIONS TO APPLICANTS.

1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to Gerritt Smith, Secretary Telegraphers' Mutual Life Insurance Association, 145 Broadway, New York, and a certificate of membership will be sent by return mail.

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

5. No letters can be answered unless a stamp is enclosed for postage; and as the officers labor without compensation, correspondence requiring answers should be as limited as possible.

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Frank L. Pope,
Associate Editor of the "Telegrapher."

New York, April 21, 1871.

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Samuel F. B. Morse.

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JOURNAL OF THE TELEGRAPH.

VOL. IV. NO. 18. NEW YORK, AUGUST 15, 1871. WHOLE NO. 91.

WIRE MAKING IN ENGLAND.

THE JOHNSON WORKS.

Of the various machines in the factory of Messrs. Johnson, there is probably not one that commands so much interest and attention as the "rolling mill," invented and patented by Mr. George Bedom, the manager of the works. The machine itself consists of a series of rollers placed in pairs alternately, horizontal and vertical. Each of these rollers are grooved, but in a decreasing order, so that a wire passing one pair of rollers is reduced in section on passing through the next. The bars of nearly uniform length and weight, are placed in a Siemen's large regenerative gas furnace placed at one end of the "mill." When the bars had arrived at their proper heat, the mill was set in motion, and the attendant at the furnace opens the doors whilst a skilled man seizes with his pincers a bar whose glowing heat was a picture. The end of the bar was inserted between the first set of rollers, where it was compressed and reduced in diameter. It was then passed into the next series, and so on, decreasing in section as it passed between the rollers, but increasing in length and in speed of motion, until it finally passes through the last series of rollers, where it was reduced to the required diameter. It will be seen, therefore, that an increasing speed of roller is requisite to meet the increased speed of the rod due to its increased length—a speed at first very slow, increasing rapidly until the red wire issued from the last roller at a tremendous rate, requiring all the speed and activity of the attendants to deliver it, and wind it up in drums. The rapid issue of the red wire, its playful convolutions over the metal floor, and the dancing about of the dusky, though skillful, attendants, together with the noise and heat, might have made one fancy he was witnessing some special incantation or scene in the infernal regions.

The iron bar of about 1 in. square was, through these various squeezings, drawn down to a wire of No. 4, B.W.G., and having a diameter of ·238in.; this wire, after it was wound on the drums, was passed into another part of the factory where it was drawn down to No. 11 guage.

The wire we have described reduced to the proper guage, was next passed through the process of galvanising—the word is a misnomer, but it remains as the usual expression for particularising the process known as covering the iron wire with a coating of zinc. The wires in coils or bundles are placed in bobbins, the several wires to be galvanized are first passed through a furnace, where they were heated to a dull red heat. After this they passed through a bath of hydrochloric acid, where they underwent a cleansing process. Next, the wires were guided by means of rollers through a large tank of molten zinc; coming out from this tank the wires passed through a mass of different material which acted as a gentle scraper, leaving the wire to go on the coiling drums nice and clean and thoroughly galvanized. The apparatus was self-acting, and required little or no attention.

It is very essential for telegraphic wire that it should be "killed"—that is, deprived of its elasticity—and further, that it should possess an even amount of tension, so that if possible a wire when used should not have less strength at one part than another. The galvanised wire is placed on a "swift" or simple loose wheel; it then passes over and under three small pulleys placed in the same line—over the first, under the second, and over the third pulley; it then passes round a large V sheave, and is drawn off on a flat drum whose circumferential velocity is greater by about two per cent. than that of the V sheave. It will be seen, therefore, that the wire as it is drawn off is constantly under a certain tension, which not only "kills" the wire, but proves also its strength.

Mr. Cromwell Varley, after describing the old-fashioned way of killing wire by hand, states, "in 1865 Messrs. Johnson had patented a machine for the testing of wire. On inspecting it he found it immensely useful; in order to try the wire which had been tested by this machine, the Electric Telegraph Company had two wires put up side by side on the London and North Western Railway between London and Rugby. The wire which had been passed through Messrs. Johnson's machine broke twice during its erection, whilst the wire which had not been passed through the machine broke 30 times. During the frost which most severely tested the wires, the tested wire did not break at all, while the non-tested wire broke in seven places." Since that period all wire has been tested.

◆

The most original writers on science are destroyed constantly by the magnitude and overpowering character of the work they have written, and by the practical results that spring from the work. In other literature the book produced lives as the book, and the learner from it, age after age, must go back to the fountain head to drink and drink; in science literature the book sinks into the fact it proclaims, and the fact remains exclusive master of the field. A striking example of this flashes across my mind at the present moment. Every reading man and woman knows that in the reign of Queen Elizabeth the book of Shakspere's had its origin, and nearly every one who has read the book (and who has not?) remembers the curious saying in it, "I'll put a girdle round the world in forty minutes." But how many are there who have read another great book of that same reign, entitled "*De Magnete;*" or are aware that at the time when Shakspere was writing his now familiar phrases, the author of the book on the magnet, the Queen's physician, one William Gilbert, when his daily toils of waiting upon the sick were over, was working with his smith in the laboratory at his furnace, needle, and compass, was writing up for the first time the word "Electricity," and was actually forging the beginnings of the very instruments that now, in less than forty seconds, put the girdle round the globe?—*Scientific American.*

We publish the following very interesting article because many will be glad to get so able an exposition of an experiment which, if successful, will prove a great boon to the public. We recommend its careful perusal, notwithstanding the foolish attempts to explode a yet unstated problem.—ED.

PAINE'S MAGNETIC MOTOR.

"A man's useful inventions subject him to insult, robbery, and abuse."—*Franklin.*

To the Editor of the Scientific American:

As no one not essentially an expert in electrical dynamics can explain why success has not heretofore crowned the efforts of the multitudes of experimentalists, so no one but such an expert can realize the obstacles overcome, and the value of the results. A technical description of Mr. Paine's engine would possess little interest for the general reader; therefore the general statement that it occupies one tenth the room of a steam engine and boiler of equal power—involves no risk of fire or explosion—can be operated in a drawing room, as regards cleanliness, and at less cost than any steam motor—expresses all that is required by the economist. But to the mind of the physicist—to such men as Doremus, Tyndall, and Henry—an investigation of Mr. Paine's treatment of the electric currents opens up a field of thought second to none in the annals of science.

While witnessing the operation of the motor we cannot fail to be impressed with the perfect unity of mechanical engineering and profound science evinced in its construction.

Take for instance the first element of the machine, the magnet. Oersted had given, to our constructor in common with others, a bar of iron traversed by electrical currents. Ampère's and Henry's observations and manipulations thereof were deemed exhaustive; and later and more practical experimentors, Page and Farmer, certified the impossibility of successful results to be obtained by electro-magnetism as regarded motive power; the former by costly experiments, and the latter by both experiment and scientific deduction.

Mr. Paine, therefore, with any hopes of success, must start from a source as original as Oersted's, and a glance at the construction of the magnet is sufficient to satisfy the expert not only of original thought but of successful application.

As the normal condition of each molecule, in the mass of iron to be magnetized, must be disturbed, it follows that if any portion of the molecules can be removed without detriment to the required polar surface, or action, that a corresponding reduction of battery, and consequently of cost, will ensue.

Imagine a parallelogram bar, twelve inches long, three inches and one-half thick, with four inches of its poles wound with insulated wire, and we have the common bar electro-magnet.

Now, Mr. Paine's researches revealed the important fact that more than one-third of the molecules in the parallelogram were absorbents of electrical force under conditions adverse to any dynamical value. These battery wasting elements were found resident in the sides of the parallelogram (outside of the curved line starting from one pole and touching the axes of the parallelogram), at its centre while being continued to the opposite pole. Remove this mass and we have the ordinary bar electro-magnet converted into Paine's sector-magnet.

This improvement relates entirely to the economizing of battery force, and considered alone adds but little to the attainment of a practical electro-motor. For however sensitive the limbs of a magnet may be to the action of a traversing current, so long as the currents are reactionary, one on the other, all hopes of obtaining valuable results from such currents are as futile as to expect value from a wheel whose back water nearly equals its head.

Electricians are aware that like currents are repellent of each other. Now, if the coil of a helix be to the right and the current moving to the right, it follows that each successive layer must be moving in the same direction, and if there be twenty layers there will be eighteen currents moving in the same direction, and reacting on each other, producing the effect on the primary current that back water does on that of the head water in the case of the water wheel.

This destructive induced action is the rock that has wrecked many a hopeful experimentalist. It is one of two obstacles of which electrical scientists have predicted the impossible in electro-motors. But to the patient investigation and persistent efforts of twenty years even this impossibility has given way, the induced currents are neutralized, leaving the primary current free to expend its full value on the limbs of the magnet.

This desirable result is obtained by the interposition between the layers, of metal foils, the theory being that the damaging induced currents expend themselves on the foil instead of reacting on the primary current. However correct or otherwise this theory may be, the results as compared with magnets not treated with the foil are most astounding.

The great magnet in the New York College was made by the Messrs. Chester, who, it is needless to remark, have, in its construction, satisfied every requirement known to scientific record. This magnet weighs seven hundred pounds, and when actuated by a battery of three hundred one-gallon cells, disturbs a weight of fifty pounds at a distance of one inch from its poles. Now a Paine magnet weighing fifty pounds, and working under a battery of nine Bunsen's cells of one quart each, has an attractive power of one hundred and four pounds at a distance of one inch and five-eighths, a difference in its favor over the college magnet, as regards battery power, of a hundred to one, and of dynamical value of almost eighty to one.

It would seem that possessing magnets of such immense power, at a mere nominal cost, that they only require the skill of the machinist to realize the wildest hopes of the enthusiast.

But just at this point—the application of the magnets to the production of continuous motion—the other insurmountable object intervenes, namely, the reflex action of the currents. Experimenters have found that magnets do not develop the same power when arranged to produce motion, as when tested in an isolated condition.

Magnets that have a dynamic value of ten when isolated, will develop less than two and one half when arranged one with the other, so as to produce rotary or reciprocating motion. All electric engines are operated by one common principle of cutting off the current from the magnet when its duty has been performed, and passing it to the next magnet in advance on the line of motion. Now, at the instant of breaking the current in the first magnet, the whole coil is charged with a current flowing, one will suppose, to the right. At the moment this current is interrupted, the current in the coil reacts to the left, giving the magnet a dynamic value equal to seventy-five per cent. of the primary current, and this seventy-five per cent. is reacting against the primary current on the magnet in advance.

Many attempts have been made to neutralize this reflex action, but to utilize it, to convert this three-fourths of retarding force into assistant power, seems to have been left to the genius of Mr. Paine to accomplish.

It is difficult to explain, without drawings for reference, the details by which this desirable result is obtained. In general terms, the magnets are so arranged with reference to each other, that when one-half the stroke is accomplished, the battery current is cut off and the reflex current expends itself in the rest of the stroke; and while the engine is being thus operated by the reflex action, the primary current is on the leading magnet, whose position is most advantageous to utilize the primary current, and thus the full battery power is economized.

In the construction of the present engine, the immense direct strain of the magnets (a strain equal to twenty tons) has necessitated the construction of a framework of peculiar and novel character. The fulcrum or stationary magnets have concave poles, and the wheel or rotating magnets are correspondingly convex.

The theoretic value of this arrangement is realized when these surfaces of the poles are worked so nearly in contact as to require lubrication. But the direct strain is so great that no massiveness of structure will secure the magnets from absolute contact, when thus attempted to be operated, and therefore a certain value of the magnetic attraction must be sacrificed to practical requirements.

The magnets in the present motor are adjusted to work at one-sixtieth of an inch, and should the frame spring that amount, the engine must stop, as the fulcrum magnets would act as a break on the wheel magnets. Mechanical engineers will understand how difficult a task it has been to devise a frame of the weight, and in the compass, of the one under consideration, that would withstand the impact of twenty tons without yielding the one-sixtieth of an inch, and yet this is most successfully accomplished in the engine under consideration.

Reflecting on the small battery cost required to develop these great forces, it would seem that all that is now required to give the world a costless power, is the discovery of some mechanical process of generating quantity currents of electricity. We have magneto-electric machines that require less than one horse-power to generate an intensity current equal to to thirty Bunsen's cells, and, as Mr. Paine's engine developes over three horse-power under three such cells, there would be a large surplus of power after operating the generating battery. But unfortunately, all machine electricity has high intensity with low quantity, and it is the latter quality that is required to give dynamic value to the magnet.

Whether Mr. Paine will overcome this difficulty is yet a question of experiment, but I may add, in view of what he has accomplished, there are strong probabilities of his success. With all these results Mr. Paine's labors are far from complete; there exist certain phenomena which have as yet baffled his powers of investigation. I refer to spasmodic action, irregularity of motion, and the uncertain life of the magnet. WINFIELD S. SIMS.

Newark, N. J.

It is remarkable how few of those engaged in commercial pursuits, and the occupations of which demand its use, ever reflect upon the results accomplished by electricity. Nor is it presumable that they ever dream of the triumphs of mechanism achieved in the profession itself, in applying this agency to the requirements of professional and mechanical art. By certain arrangements the presence of this invisible fluid is measured with such accuracy that, though flowing through a conductor hundreds of fathoms beneath the surface of the sea, should the most infinitesimal portion escape, the location of the escapement could be placed within the fragment of a yard, though it were a thousand miles away; and by another instrument, so delicate that a spider's thread sustains it, signals can be recorded by its deflections, though influenced alone by a current of electricity, generated in a percussion cap, and transmitted through a conductor thousands of miles in extent.

The mind is lost in the bewildering contemplation of the uses which yet remain to be discovered; for, as the Almighty selected this power to direct the movements and sustain in their relative positions the systems of the universe of worlds which surround us, what cannot man, in the reason and intelligence which was incorporated in his being, succeed in accomplishing, in the application of this stupendous force to the requirements and to the ambition of his existence?

When steam shall have been deprived of its great claims as the supreme source of artificial power, and this silent, powerful, electrical force shall be performing all its functions, and surpassing a thousand fold its use in the arts and sciences, mankind will look back upon the time when one man discovered the secret of its application, and invented the mechanism to develop it, and will point to him as the greatest benefactor of mankind. For though a triumphant and conquering General is great, and he who brings peace unto a nation is greater, yet, the man who promotes the advancement of civilization and prosperity is greatest of them all.

There is a peculiar significance in the ceremonies which recently took place upon the occasion of the unveiling of the Morse statue in Central Park. It is not a testimonial of eulogistic praise from the world to the honored dead, but a tribute of gratitude offered to the living inventor from those who have been benefitted by a great invention, by its furnishing them an honorable support. How appropriate such a deed, and how creditable to those who are animated by such generous impulses, and how becoming it is for the great benefactor to receive such a testimony from such a source. While all who are engaged in this object observe with pleasurable pride the evidences of their long cherished desire, let all mankind unite in wishing long years of happiness and prosperity to the recipient, and when he shall retire full of honors from this earthly home to the everlasting resting place above, let us hope his last moments will be peaceful and quiet, and that he will breathe his last "like one who wraps the drapery of his couch about him and lies down to pleasant dreams." F. P. B.

—*Savannah Morning News, June* 13, 1871.

Mr. Morse appears to have been the first who placed the electro magnet in a conspicuous position in electricity.—*London Engineering, July* 15, 1871.

REMARKABLE ELECTRICAL PHENOMENA.

A correspondent of the Baker City (Oregon) *Democrat* gives the following account of strange electrical phenomena noticed in that State: "Our tent is pitched about 400 yards below the Clover Ferry, on Snake River. The surrounding country gives evidences of an early Spring, as the grass has fully matured, giving the hills a brown tinge. The weather is oppressively warm. I think a thermometer would indicate 120° in the shade. The heat was so intense that the miners on the Bar refused to labor. At 7 P. M. a cloud arose to the south of us, and distant thunder was heard, and all rejoiced at the prospect of rain. The cloud rapidly increased in size and density, and gradually approached us. At 8 P. M. it had reached to the northward of us. Electrical discharges were frequent, and the thunder shook the earth. While five of us were witnessing this grand pyrotechnic display of nature, a flash intensely bright, zigzagged down the side of a mountain, distant about half a mile. The thunder instantly pealed forth a terrific shock, and before its reverberations had died away in the distance, we discovered the grass on fire on the mountain's side, directly in the track of the electrical current. The question arose: Had the lightning set the grass on fire? My companion remarked: 'If there were any hostile Indians in this vicinity I should regard it as a signal fire.' Before we had time to reply to his remarks another discharge came down a hillside 200 yards nearer to us. Again the grass was ignited. While expressing our astonishment at this phenomenon, another discharge descended the hillside parallel to the preceding current, and again the burning grass marked its course. This was something rarely seen, and never before witnessed by any of us. Inside of ten minutes the grass was three times set on fire by electricity. The same phenomenon occurred once, during the same storm, on Mr. Edleman's ranch, one mile up the river. While we were witnessing the freaks of electricity on the north side of the river, a fire burst forth on the south side. From a deep gorge a few hundred yards below camp a dense smoke came rolling down to the river, showing that the storm-king had been playing his pranks there, too. A smart shower of rain soon extinguished the fires, dissipated the smoke and purified and cooled the atmosphere, rendering sleep enjoyable in our tent."

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QUEER EXPLOITS OF LIGHTNING.

From the Lockport Journal.

On Friday morning last, about 2 o'clock, a thunder-shower passed over the village of Sanborn, situated on the Central Railroad, midway between Lockport and Niagara Falls. No rain was falling at the time, nor was there but a slight shower thereafter. The lightning struck the house of Joseph Richardson, Esq., a farmer, living about a mile north-west of the village. It seemed to have been struck in two places at the same time. The house is about 22 by 28, one and a half stories high, with a kitchen and wood-shed back. The lightning struck on the roof, at the south-east corner of the upright, scattering the shingles for four or five feet around, breaking through the roof-boards and ceiling, hurling the lath and plastering all over the room. Two young men, one the son of Mr. Richardson, were sleeping immediately under where the roof and ceiling were broken. One of them, John Daily, was thrown out of bed across the room, and was unable to rise; he is burned across the hips and in the small of the back. Ami Richardson, the son who slept next to the wall, was burned on one of his thumbs and on one limb, so that blisters as large as hickory nuts were produced. Another young man, who slept in an adjoining room, was thrown out of bed, partially across the room under a table, but received no other injury except several slight bruises. At the same corner of the house, under the ground, an orifice was made the size of a man's arm, which entered the cellar through a two-foot wall six feet below the surface. Fruit-cans were overturned. A pan of eggs sitting on a bench were broken, without apparently disturbing the tin. The electric fluid then passed up through the floor, splintering the boards, tearing a three-ply carpet into shreds for two or three square feet, breaking off a stove-leg and throwing a piece into a chair near by. The kitchen-door on the east side of the wing, some twenty or thirty feet south-west of the point first described, was burst open, breaking the latch and tearing off the door-casting. A large dent was made in the stove-pipe in the middle of the room, and the wall marred on the opposite side of the room. Furthermore, a furrow was ploughed south from the house thirty or forty feet in length, having a depth of some six inches. The lightning apparently struck on the north-east corner of the house, at the same time about six feet from the ground, where a metallic clothes-line was attached. A part of the fluid passed down, tearing off the siding and through the wall into the corner of the cellar; another portion followed the wire about twenty feet to a tree, where the wire was burned off. It turned a right angle there, and the next twenty feet of the wire cannot be found, but its direction was followed to a cherry tree, which was torn in pieces; some of the fragments were thrown four or five rods. It then branched off, one portion running to the well, scattering the platform and loosening the pump, at a joint ten feet below the surface of the ground, so injuring it that it is unfit for use. This is, unquestionably, one of the most singular freaks of the element on record. But what is more remarkable is, that after breaking twenty-eight lights of glass, throwing persons out of bed, and in fact nearly demolishing the house, no one was seriously injured, neither did any fire originate from the shock. The house and cellar were filled with smoke, and a strong odor of brimstone was noticed by the occupants.

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The European goverments, following the same policy they have pursued with regard to the highways, post and railroads, have constructed and operate the lines of telegraph. But in America a different system has prevailed. Our roads have been made and kept in repair by the local authorities; our railroads are built and run by private companies; our mails have never been transported by the Post Office Department, as they are abroad, but invariably by mail carriers under a contract with the Government. The system which provides for the purchase, construction, maintenance, and operation of the telegraph by the post office is therefore in harmony with European institutions; but a postal telegraph system, in harmony with American institutions, must be one by which all letters, both mail and telegraphic, are received and delivered through the post office, but transmitted under contract by parties furnishing all necessary instrumentalities for that purpose. The advantages of the European system are the low cost of lines, superior quality, freedom from competition, low rates for inland messages, and its more extended use for social and ordinary mercantile business. The advantages of our system are the greater facilities afforded, its more extended use for certain kinds of business, and by the press. The postal system for America should combine the advantages of each.

A new telegraphic system for our country, which simply copies that of any other, must fail, so different are the habits and business of different countries. It is necessary to study the wants of those who use the telegraph, combine the best features of our own and foreign systems, avail ourselves of the services of the efficient executive officers of our companies and their skilled operators, and with our fine climate we may expect in a few years to have the best and cheapest telegraph in the world.—*Hubbard's Report.*

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M. C. AND L. R. R. CALLS.

BY NABROC.

Our calls are all very short and good—
  Better than some, I guess;
And answered promptly, if we do "cut our wood,"
  The dispatcher's call is "K. S."

"K. S." is supreme, both night and day;
  Sometimes it makes the boys sigh;
Danville is known as "D. A.,"
  And Guthrie is christened "S. Y."

Tennessee Ridge is called "D. K.,"
  Clarksville (freight office) is "Q.,"
Clarksville (City) is called "C. K.,"
  And is run by the "W. U."

Paris is called "O. R." in turn,
  Carbandale only "C.,"
Erin is named "R. N.,"
  Big Sandy is known as "S. D."

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THE GYMNOTUS AND ITS CAPTURE.

The marshy waters of Bera and Rastro are filled with innumerable electric eels, who can at pleasure discharge from every part of their slimy yellow-speckled bodies a deadening shock. This species of gymnotus is about six feet in length. It is powerful enough to kill the largest animals when it discharges its nervous organs at one shock in a favorable direction. It was once found necessary to change the line of road from Uritneer across the Steppe, owing to the number of gymnoti, which had accumulated there in great numbers. All other species of fish shun the vicinity of these formidable creatures. Even the angler, when fishing from the high bank, is in dread lest an electric shock should be conveyed to him along the moistened line. Thus, in these regions, the electric fire breaks forth from the lowest depths of the waterr. The mode of capturing the gymnotus affords a picturesque spectacle. A number of mules and horses are driven into a swamp, which is closely surrounded by Indians, until the unusual noise excites the daring fish to venture on an attack. Serpent-like they are seen swimming along the surface of the water, striving cunningly to glide under the bellies of the horses. By the force of their invisible blows numbers of the poor animals are suddenly prostrated; others snorting and panting, their manes erect, their eyes wildly flashing with terror, rush madly from the raging storm; but the Indians, armed with long bamboo staves, drive them back in the midst of the pool. By degrees the fury of this unequal contest begins to slacken. Like clouds that have discharged their electricity, the wearied eels disperse. They require long rest and nourishing food to repair the galvanic force which they have so lavishly expended. Their shocks gradually become weaker and weaker. Terrified by the noise of the trampling horses, they timidly approach the brink of the morass, where they are wounded by harpoons, and drawn on shore by non-conducting poles of dry wood. Such is the remarkable contest between horses and fish. That which constitutes the living but invisible weapon of these inhabitants of the water—that which, awakened by the contact of moist and dissimilar particles, circulates through all the organs of animals and plants—that which, flashing amid the roar of thunder, illuminates the wide canopy of heaven—which binds iron to iron, and directs the silent recurring course of the magnetic needle—all, like the varied hues of the refracted ray of light, flow from one common source, and all blend together into one eternal all-pervading power.—*Baron Von Humboldt.*

ANOTHER PRACTICAL SUGGESTION.

CINCINNATI, OHIO, July 28, 1871.

To the Editor of the Journal of the Telegraph:

I have a plan for working ocean cables and land lines, which in cables will insure a much greater speed, and admit of the use of Morse instruments. The plan may be an old one, but let that be as it may, it is entirely original with me, and, therefore, I wish to see its merits tested.

To work an ocean cable place a negative pole at one end, and positive at the other. This can be accomplished very easily by burying a porous cup at each end of the line, in the earth a sufficient depth to insure a perfect earth connection; in one suspend a plate of platinum in nitric acid, and in the other a bar of zinc in a weak solution of sulphuric acid; then connect them to the line in the usual manner. By this it will readily be seen that induction, which, in my estimation, is nothing more or less than the electricity trying to force its way through the insulators and form a return circuit, will be entirely dispensed with, as the battery is not complete until the poles are connected by the line, consequently the battery not being complete within itself at each end of the cable, or line, cannot create any circuit which will try to return until it has traversed the wire to the opposite pole. This system of putting negative at one end and positive at the other, will, in time, be extensively used on land lines, as wires which are now practically useless can be worked during all kinds of weather with perfect success. I made several tests, two years ago, on thirty miles of line wire, and, afterwards, on one hundred, and found that the effect of the ground wire, or any ground connection, only diminished the circuit but did not affect the clearness of the signals in the least. The effective force of a given number of cups, divided, was only one half of what it was when connected in the usual way, but the battery continued to work about twice as long; therefore, all things considered, its force being equal, hoping that this may be fully tested,

I remain, very respectfully,

GEO. A. FITCH.

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QUERIES ABOUT LOCAL BATTERIES.

MARSEILLES, ILL., July 25, 1871.

To the Editor of the Journal of the Telegraph:

In JOURNAL of May 1st, 1871, I notice a communication from the operator and ticket agent P. & K. R. R., Augusta, Me., dated April 22, 1871, relative to "*running*" local for one year, without cleaning zincs. It is needless to say that the suggestions contained in above are valuable and interesting to all operators having charge of batteries, as they aim at two important considerations, viz.: A great saving of material and labor, in keeping up "locals."

Prompted by an honest desire for information in the matter I respectfully propound the following questions, and will feel very much obliged for a reply through the columns of the JOURNAL:

Will the copper sheets work for a year without having the deposits of the vitriolic solutions removed from them?

Do you think the fact of having *stone* jars, instead of *glass*, makes any essential difference in this plan of treating the battery?

Will not the object of preventing copper encrustations on the porous cup be accomplished as successfully by placing a piece of *wood* in bottom of cup as by suspending zinc from top of cup by wire?

I have used the wood for this purpose, and find it entirely successful in preventing the copper from forming on cup, but do not know whether it operates otherwise against the strength of the local; I prefer it to the wire, from the fact that the zinc rests *firmly* on the bottom, and cannot *swing* against the sides of the cup, as it is liable to do by being "suspended" by wire on top of cup.

Will it not be necessary to remove deposits from zinc in bottom of porous cups oftener than once a year?

Yours truly,

A. RYALL,
Opr. & Ticket Agt. C. R. I. & P. R. R.

LOCAL BATTERIES.

JULY 22d, 1871.

To the Editor of the Journal of the Telegraph:

I am quite surprised that the telegraph company does not publish (in your valuable JOURNAL) a receipt for preventing the formation of copper on the porous cups of the Daniell battery. I have the care of three jars, one of which works very uneconomically; instead of the "copper" being covered with a quarter inch shell of copper, the porous cup is coated beautifully with about a half inch of crystals of copper, while the "copper" is gradually eaten away to supply copper to that on the porous cup. One of your correspondents advises the covering of the porous cup with cloth, but in this I disagree with him, although I have never tried it.

In 1833, some English gentlemen, experimenting on silk as a substitute for bladder in manufacturing porous cups, found their only objection to the silk was the depositing of copper on its sides which soon stopped the action of the battery.

Yours respectfully, G. H. C.

MIDDLETOWN, O., July 25, 1871.

To the Editor of the Journal of the Telegraph:

I have a short circuit from my office to a building across the street. In cleaning the battery the circuit was made, leaving out the copper of one cup. We then tried to work the circuit, and found, on closing our key, the magnets would not attract the steel bar, and when we opened the key it did, and the line was perfectly straight, making a complete circuit. The line was a complete local circuit, and seemed to have a repulsive current. Has such a thing ever been known?

Yours, respectfully,

A. J. L.

Ans.—If the connection at the magnet had been reversed, the usual action, reduced by leaving out one cell, would have been attained. A magnet, with cores not well annealed, becomes, to some degree, a fixed magnet, and, in changing poles at the battery, will sometimes act as described.

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A PROFESSION of science is no doubt organizing. The world is at last asking more of science to employ themselves in teaching the world: and the teachers, bending to the labor, are, in their turn, willing to suspect that they are but as children, or at best youths, in the race after knowledge. This is most hopeful; and it is hopeful also to find that men who claim to be conservators of a knowledge that was matured when science was unborn, are listening now to our scholars with an attentive ear, and are beginning now to accept that the Lord of Nature, whether He reveal Himself to the ancient law-giver in the burning bush that was not consumed, or to the modern astronomer in the burning glory of the omnipotent sun, is one and the same Lord. Thus there is hope, I may say certainty, in the future for the literature of science; for its poetry, its parables, its facts, nay, even for its religion.—*Scientific American.*

THE POSTAL SERVICE—EUROPE AND AMERICA COMPARED.

2 GT. WINCHESTER ST. BUILDINGS,
LONDON, May 11, 1871.

To the Editor of the Journal of the Telegraph:

I sent off twenty copies of my paper to you on the 20th March by book-post, and you will possibly find them, on enquiry, either at New York or Washington.

Although I admire, on the whole, the American institutions more than those of this country, I must still, in frankness, confess that the management of your Post Office is simply execrable. Newspapers sent to me when I was in New York were never delivered, and when I enquired for them I frequently failed to get them. I cannot understand a practical people like the Americans submitting to a Post Office inferior to the worst in Old Europe.

Last November I went overland to Egypt. One letter, which arrived too late for me at Cologne, followed me, with a newspaper, to Munich. It then followed me to Verona, but failing to catch me there, it was sent on to Rome, where it arrived just too late and was forwarded to Naples; thence it found its way to Catarina in Sicily, but too late for me again, so it was forwarded to Malta, but I had gone on to Alexandria. The letter was kept some time at Malta, and returned to Cologne, at my desire; it was too late to catch me. I reached home the latter end of December, and the letter and newspaper were sent on to London, without any extra charge.

If England, France, Belgium, Germany, Sicily, Malta, and other countries, can combine to make such "postal arrangements" as these, surely the United States, with greater enlightenment and freer institutions, ought to be ashamed of themselves that they do not do their postal service better than the Old World.

As you are connected with a great and powerful public Company, I hope you will be able to bring your lazy, careless postal officials out of their degradation.

You may do what you like with this letter.

I enclose you another copy of my paper, as possibly you may desire to use it; as, however, your book-post is wholly unreliable, I go to the expense of enclosing this and registering it, the only way of getting a pamphlet delivered in America.

With kindest regards to yourself and all dear friends, believe me to be,

Very truly yours,

C. F. VARLEY.

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GOLD AND STOCK TELEGRAPH COMPANY.

Directors—Tracy R. Edson, William Orton, Joseph Larocque, Marshall Lefferts, William B. Clerke, Alonzo B. Cornell, Joseph M. Cook.

This company furnish gold and stock quotations, cotton and produce exchange and general commercial news reports to its subscribers, by telegraphic printing instruments, at their respective places of business; and also erect and maintain private telegraph lines for corporations and individuals, operated with printing instruments.

This company manufactures all the perfect telegraphic printing instruments in use, are owners of a large number of patents, and are prepared, under facilities of contracts with the Western Union Telegraph Company, to extend the system of commercial reports and private lines to all parts of the United States.

Marshall Lefferts, President; Joseph M. Cook, Vice-President; Norman C. Miller, Treasurer; Horace L. Hotchkiss, Secretary; Edward A. Calahan, Superintendent.

General Offices—No. 61 Broadway, New York.

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We will endeavor to reply fully to the queries respecting local batteries, and will furnish all the information we can respecting them, but must defer this until next number.

A LIBERAL PATRON OF THE TELEGRAPH, AND THE NATURAL CONSEQUENCE.

The largest dry-goods house in the State of Pennsylvania was recently opened with becoming ceremonies in Alleghany City. It is owned and controlled by William Semple, Esq., who is known as the A. T. Stewart of the west. He is a Scotchman by birth, and in every respect a self-made man. He came to this country some twenty years ago, the possessor of a single shilling ; entered a retail store in Pittsburg as a salesman, and by careful industry and honest dealings, together with an ample share of Scotch energy, he has risen to his present proud position.

The new building is 190 feet deep by 60 wide, six stories high, and the front one of the handsomest in the country. There are two elevators, one for freight and the other for passengers, the latter being the finest arrangement of the kind in the United States. By using iron pillars, each floor is thrown into one vast room 190x60 feet. There are 500 gas jets throughout the building, and the whole is heated by steam from the engines that move the elevators. The steam and gas pipes, if placed in a straight line, would reach a distance of seven miles. One hundred and ten clerks are kept busy in the retail department alone, and the whole establishment moves like clock-work under the watchful eye and active brain of the proprietor.

Of course such a man as this is a liberal patron of the press and the telegraph. A private line runs from the Western Union office to the store and from there to Mr. Semple's residence on the West Park. On the night of his grand opening, the wires were taken to the banquet hall on the fourth story, where congratulations were received all the evening ; one from Hamilton, Scotland, from the Governor of Pennsylvania, Col. T. A. Scott, of the Pennsylvania Railroad, &c. He uses the telegraph liberally, but more especially in the evenings, when, after a busy day's work, he sits down in his comfortable home, looks over his samples and correspondence, and then indites to his son (who does the telegraphing) a perfect flood of telegraph orders to eastern houses for goods, the most of which will be in his business house before the next evening.

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We print the following as a piece of telegraphic humor :

GLASS VERSUS IRON INSULATORS.

[*Correspondence.*]

GOOBERTOWN, GA., July 1, 1871.

LITENIN BUGG, ESQ., Operator, Repairer, Messenger, &c., Persimmonville, N. C.:

Dear Litenin : I beg leave to call your attention to the printed works of Mr. F. L. Vandenburg, Supt., which have been printed several times during the past two years alternately in Philadelphia and New York. I quote them in full as follows :

"CENTRAL PACIFIC RAILROAD CO.,
SACRAMENTO, May 22, 1869.

"I worked my line on Brooks' insulators from Promontory to
"Wadsworth, 550 miles, through heavy rain clear of escape,
"when Union Pacific could not work to Corin, 40 miles, through
"same storm. They use glass and brackets.

(Signed) "F. L. VANDENBURG, Supt."

Mr. Vandenburg writes again :

"SACRAMENTO, July 21, 1870.

"I have worked my No. 2 direct from San Francisco to Og-
"den every hour since line was completed in May, 1869 ; dis-
"tance way line runs nine hundred miles. On this circuit I
"use Brooks' insulators."

Mr. Vandenburg again remarks, Feb. 5, 1871 :

"The glass and bracket lines have just recovered from a ten
"days' rain, but my No. 2 never made a slip, but worked
"through all the time."

You will not fail to observe that Mr. Vandenburg is greatly distressed because the U. P. cannot "work to Corin 40 miles." So am I. Thinking that you can relieve us, I have the honor of propounding to you the following questions, viz :

Does a glass and bracket line ever fail to "work 40 miles," either in wet or dry weather ?

If so, why ?

What ails the Union Pacific ? and what plan do you recommend for working the lines "to Corin 40 miles" ?

I would call your attention to Mr. Vandenburg's "No. 2," which should be designated as "A 1." This line has "never made a slip," which is somewhat remarkable, as the insulators are greased !

Does a glass and bracket line ever slip ?

What is your opinion of Brooks' insulators ?

By a prompt reply you will oblige

Your friend, ALICK TRISSITY.

P. S. The goober "crop" is promising. Come down in the Fall.

—

PERSIMMONVILLE, N. C., July 5, 1871.

ALICK TRISSITY, ESQ., Goobertown, Ga.:

Dear Alick : Your favor of July 1st received, and I have given the subject careful consideration. The Persimmon "crop" has been cut off by the frost, and it is an utter failure. It was under these melancholy circumstances that your letter reached me. The delay in replying is attributable to this great misfortune ; but, persimmons or no persimmons, I plunge once more into my philosophical pursuits, and proceed to answer your questions in their order. A glass and bracket line *often* fails to work forty miles in both wet and dry weather. My section will not sometimes work five miles in any kind of weather. I use glass and brackets. This has been the case several times within the past two months, and it has happened a hundred times during my long experience ; but in every instance, without a single exception, the lines were broken or grounded. The moment a glass and bracket line breaks, it somehow begins to stop working through, and I am straightway ordered out to repair ; and this is the reason I am opposed to glass and brackets. I have no time at present to enter into a scientific explanation of the causes which prevent a glass and bracket line from working when broken, but I state the fact with some degree of confidence.

This is what ails the U. P. if it will not "work to Corin 40 miles." The wires are broken. It is strange that the managers of those lines have not learned that fact during the past two years. We would have found it out sooner in North Carolina. My advice to the U. P. is, to keep up the lines to "Corin 40 miles." Mortgage the railroad, if necessary, to secure adequate funds. It is useless to attempt to work the lines when broken. A glass and bracket line will work forty miles in any kind of weather, when it is in good order. In this country, where the rains are often "heavy," and sometimes damp, my lines have worked forty-ONE miles and upwards. I use glass and brackets ! Sorry to say it !

If the U. P. cannot "work to Corin 40 miles," after repairing all the breaks, I would recommend repeaters every five miles ; or, if Corin is not a large town, it might be moved nearer the battery as a temporary expedient, until the U. P. can substitute iron insulators for glass, which I advise.

A glass and bracket line don't slip if *well tied.* I think the tendency to slip is greater on greased insulators ; but the grease soon runs out. The Bugg family don't like paraffine or iron insulators, when new. They are rather offensive at first, but they soon become very agreeable and comfortable. I am confident a line on this insulation will work, whether up or down, broken or otherwise. In proof of which I refer you to Mr. Vandenburg's No. 2 (A 1 ?) which is nine hundred miles long and "worked *every hour*" for a year. A line which will work when broken is a great "*desideratum*" (if you will permit me to use a *German* term) and will save repairers much trouble.

Your friend. LITENIN BUGG.

◆

QUICK TELEGRAPHING.—Yesterday at 11:55 A. M. a dispatch was sent from the telegraph office in this place to New York City, and an answer was received at 1:30 P. M., having made the circuit of three thousand miles in just one hour and thirty-five minutes. This is very quick work, especially when it is considered that after the reception of the dispatch in New York it was necessary to effect a business transaction to the amount of $14,000; and of which there had been no previous notice given, before the return message could be sent.—*Sioux Daily Journal.*

◆

We have received a letter from Gingertown, which we would like to publish for the fun of it, and the fun in it. But we think we had better not. When Jerusha Snuggings comes to New York we can talk it over. We have had as much kissing as is healthy in warm weather.

◆

THE DESCENT OF MAN.

A CONTINUATION OF AN OLD SONG.

Air—"Greensleeves." (*Darwin loquitur.*)

"Man comes from a mammal that lived up a tree,
And a great coat of hair on his outside had he.
Very much like the dreadnoughts we frequently see—
Which nobody can deny.

He had points to his ears, and a tail to his rump.
To assist him with ease through the branches to jump—
In some cases quite long, and in some a mere stump—
Which nobody can deny.

"This mammal, abstaining from mischievous pranks,
Was thought worthy in time to be raised from the ranks,
And with some small ado came to stand on two shanks—
Which nobody can deny.

"Thus planted, his course he so prudently steered,
That his hand soon improved and his intellect cleared;
Then his forehead enlarged and his tail disappeared—
Which nobody can deny.

"'Tisn't easy to settle when Man became Man;
When the Monkey type stopped and the Human began;
But some very queer things were involved in the plan—
Which nobody can deny.

"Women plainly had beards and big whiskers at first;
While the man supplied milk when the baby was nursed;
And some other strong facts I could tell—if I durst—
Which nobody can deny.

"Our arboreal sire had a pedigree too;
One Marsupial system comes here into view;
So we'll trace him, I think, to a great Kangaroo-
Which nobody can deny.

"The Kangaroo's parent, perhaps, was a bird;
But an Ornithorhyncus would not be absurd;
Then to frogs and strange fishes we back are referred—
Which nobody can deny."

Thus far Darwin has said: But the root of the Tree,
Its nature, its name, and what caused it to be,
Seem a secret to him, just as much as to me—
Which nobody can deny.

Did it always exist as a great institution?
And what made it start on its first evolution?
As to this our good friend offers no contribution—
Which nobody can deny.

Yet I think that if Darwin would make a clean breast,
Some botanical views would be frankly confessed,
And that all flesh is grass would stand boldly expressed—
Which nobody can deny.

—*Blackwood.*

Journal of the Telegraph.

This Journal is issued on the 1st and 15th of each month. Its circulation is 6,500. It goes to every State, Territory, and Province on the continent. It is fast becoming a necessity, and is already welcomed as a friend. No better medium for advertising exists.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, AUGUST 15, 1871.

MR. ORTON'S ILLNESS.

The press has so generally circulated the fact of Mr. Orton's recent illness, that we deem it our duty to say, that although his sickness has been severe and protracted, there is now every assurance of rapid and complete restoration. Overworked nature has been taking her revenge, and compelled him to rest.

◆

NICHOLSON'S DOUBLE ALPHABET.

Dr. H. C. Nicholson, of Mount Washington, Hamilton Co., O., has recently been experimenting upon a wire extending from Maysville, Ky., to Cincinnati, O., using his plan for registering an entire Morse letter by a single action on two keys on a single wire. In this he claims to have succeeded. How he accomplished it we have only partially learned. He claims by this process to have reduced the number of movements in constructing the alphabet from 81 to 27. This is done as follows:

Two keys are used at one end of the line, two sounders at the other. The keys are near each other, the sounders on opposite sides of the operator receiving. A dot on the right key affects the sounder on the corresponding sounder, and signifies e; on the left l; when struck synchronously a. In like manner a short line on the right is n; on the left y; on both o. A single wire is used, and the independent action on the separate sounders is accomplished, we presume, by reversed currents. There is evident ingenuity here, and perhaps the possibility shown of transmitting signals with increased rapidity, it may be with increased ease. But we cannot help regret to read, in connection with Dr. Nicholson's success in demonstrating this result, that in doing so he has expended his "bottom dollar." We believe such processes can never be popular or of much practical use.

1. By the present process an operator can keep up with the fastest penman. Of what use, therefore, can a sound instrument be which transmits faster than the hand can transcribe.

2. It must be evident that any mode for utilizing reversed currents must depend on a very unobstructed and highly insulated conductor. That, generally, this is not possible to secure at all times on the best circuits is well known.

3. All plans for improving electrical transmission must take the direction of relief to the operator's brain. Now to our mind the variations of the Morse alphabet on a single sounder from a single point are simpler and less distracting than listening to a sound from both sides. A majority of learners would probably so decide. Take, for example, the letter z. This is composed of a long line on the right, and a dot, mid way, on the left. If the dot is not in the centre it becomes either b or r. This accuracy, of course, can be attained, but it seems clear that the process of listening to two synchronous sounds, though of unequal length, from opposite sides, must be a greater demand on the brain than those successively made in the ordinary alphabet.

4. The speed attained has been from 25 to 30 words per minute, although it is claimed to be susceptible of much more. This does not exceed the average reception of newspaper reports on the present system.

◆

THE LOCAL BATTERY.

The receipt of letters making sundry enquiries in reference to the action of local batteries and of the material composing them, gives us the opportunity of saying one or two apparently necessary words respecting them. It is a promising sign when the attaches of any company become interested in solving the details of the operation upon which its business is conducted.

What we desire to say now has really been better, because more practically, said by Mr. Walker, of Augusta, Me., in his letter which we published a few months ago. This brief article will, therefore, be in the main a mere repetiton of the result of his experience.

1. There is no more common error than the cramming of the cells with the sulphate of copper. It is not only erroneous, but eminently wasteful and destructive of power. Some cast great quantities into the cells to obtain speedy action after changing or cleaning; others do it to save labor, in which they greatly deceive themselves; more still, through thoughtlessness and indifference. In either case the result is over action, followed by rapid deposits of chrystal on the metals, and the final stoppage of action. This, in turn, is followed by the renewal of the battery, in which too often a large mass of half used material is thrown away, or an amount of cleaning resorted to which every operator, it is supposable, would be anxious to avoid.

2. To obviate a good deal of this very prevalent evil, we suggest that a portion of sulphate of copper equal to three-fourths of the capacity of the pocket of the copper cylinder, be put to saturate in a vessel of water the night before it is required for the building or renovation of a battery. By pouring this into the cell in the morning, and supplying the pocket with a few chrystals of the sulphate, action will at once be obtained. On no account allow the sulphate to be crowded into the jar. As a general rule the presence of undissolved particles of the sulphate proves that the water has absorbed all it can use. It is well to be satisfied with an amount of power sufficient for sound of moderate degree and add chrystals of the sulphate only as the sound requires it. This will prevent over action and keep the batteries in working condition for a long period with trifling labor. Do not remove the armature too far from the magnet or make the play too great. Sound is wanted, not noise.

3. As many of the porous cups are impure and have much metal dust in them the copper is apt to be deposited upon them. By allowing the zinc to touch the porous cup this tendency is greatly increased and a local action established on the walls of the porous cell which soon renders the battery valueless. The zinc must therefore either be suspended, as by Mr. Walker, with a wire through the neck resting on the edges of the cell, or by a small block of wood which our correspondent elsewhere states can be used to better advantage. This suspension or separation is necessary even where the cells are pure, for otherwise the inter operation of the metals must be vitiated more or less by local action within the cell.

Attention to these two points will save much labor and more money. We will refer to this again.

◆

A GOOD MAN HONORED.

Among the many excellent men who direct the active operations of American telegraph lines, Mr. O. H. Booth, of Mansfield, O., has always ranked as among the most prominently careful, vigorous, and true. In no trust reposed in him has he ever disappointed expectation. It has thus happened that his responsibilities have been constantly enlarging, until his field has become larger than the average entrusted to a single superintendence. By an order issued August 1, by the officers of the Pittsburgh, Cincinnati, and St. Louis R. R. Co., Mr. Booth's supervision is now extended over all the lines owned or operated by that company, making, with the field of his former duties, the largest Railroad Telegraph District in the country, and which embraces

225 offices,
350 employes,
2,000 miles of line.

We have no doubt of Mr. Booth's capacity for his added duties, and rejoice in the honors of such a trust thus worthily bestowed. We congratulate the company in the possession of such an officer.

◆

Mr. David Brooks has, after withdrawing his former advertisement for a time, returned with a new one, to be read by our 7,000 or more readers, and which of itself is a proof of intelligence. We have never regarded it as our duty to puff Mr. Brook's insulators, for we do not pretend to know more of their value than other men, yet we have carefully published the Silvertown tests by which their insulating qualities were so remarkably attested, and have felt sure that experience in their use, if found true to their promise, would lead to a corresponding demand. Puffs are often proof of silvered palms.

Mr. Brooks now announces himself as agent for the celebrated European establishment of Siemens Bros., and undertakes to furnish the cables, wires, galvanometers, multiplicators, and all electro-metrical machinery made by that firm. We need only say that there is no more admirably constructed work in the world than that made by the firm of which Mr. Brooks is now agent.

◆

We have to acknowledge the receipt of an announcement of the organization of a new manufactory of telegraphic machinery in Cleveland, O., in which our old friend Geo. B. Hicks is principal and Mr. Geo. W. Shawk partner. Last issue we published the advertisement of M. A. Buel, who has a similar manufactory at the same city. The call for telegraph machinery is the most marvellous evidence of the energy of the times. Tillotson & Co., of New York, inform us that with forty skilled men they cannot keep up with their orders. So of other houses.

Executive Order No. 127.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
August 10, 1871.

"HALF-RATE FRANKS."

INSTRUCTIONS TO MANAGERS.

In pursuance of contracts with certain corporations for reciprocal service, a new class of "Franks" has been issued by this Company, upon presentation of which, at any time during office hours, the holders will be entitled to transmit messages on account thereof, between all points on Western Union lines, *on payment of one-half the regular day rates.* No message sent under these "Franks" will be charged less than twenty-five cents, and the half-rate privilege thereby granted will not be construed to reduce any tariff below that amount.

Each "Frank" is numbered, and states on its face the name of the person to whom it is issued, and the period of time it is designed to cover.

ANSWERS to messages are NOT covered by these "Franks." All messages sent under "HALF-RATE FRANKS" will be CHECKED AT FULL RATES, and offices sending such messages will return them as "UNCOLLECTED," entering in "uncollected" account the uncollected one-half of the tolls, and forwarding the messages with their monthly reports as vouchers.

WILLIAM ORTON, *President.*

"POST OFFICE NIGGERS."

Under this caption the wide-awake London correspondent of the *N. Y. Tribune*, G. W. S., writes as follows respecting the British Telegraphic administration:

Two reports which, though apparently quite distinct, are really complements of and explain each other, have just been published. One is

AN IMPOSING DOCUMENT

from Mr. Frank Ives Scudamore, who runs the British Post Office and—except that the word run expresses too much speed to be used in connection with his management—the Postal Telegraphs as well. This document is a report of the financial results of the telegraph administration. It states the gross revenue for the first fourteen months after the Government assumed charge of the telegr. phs as being nearly $4,000,000. It is

NOT SO EASY TO DISCOVER

what the expenses have been, for Mr. Scudamore feels himself under the necessity of presenting a good balance sheet, and has exercised a wide discretion as to what must be called current expenditure, and what may be charged to construction account—a phrase which has a sinister meaning here as well as in America, and has cloaked a vast deal of wasteful and incompetent management in both countries. By help of this convenient distribution, Mr. Scudamore gets an estimated expense account of only $2,350,000. The balance of $1,650,000 has to cover the interest on the capital invested by the Government in the purchase of the telegraphs, amounting to $35,000,000, together with the cost of extensions, restorations, and what are called general improvements. The expenses charged to construction account appear to be $2,000,000, or about a million dollars more than the receipts of the fourteen months, and Mr. Scudamore

WANTS A LOAN OF $5,000,000

to enable him to pay off these debts and carry out his plans for the future.

But let us assume that Mr. Scudamore's statement of accounts is correct; that he has charged only what ought to be charged to construction account; that his claim of $1,650,000 as excess of receipts in the fourteen months, over proper working expenses, is not cooked or fictitious, and that his balance does really cover the interest account and leave a genuine profit to the credit of his management. Admitting all this,

HOW DID HE GET HIS BALANCE?

We shall find some help in answering this question from the second report which I have mentioned. This is a report of a

CORONER'S INQUEST

on the body of James Whitaker, aged 15 years, an instrument clerk in the postal telegraph office, Morperth Court, Lothbury, in the city of London. It appeared from the evidence, says the report in the *Daily News* of July 26, that the deceased had been employed in the above office for three months. He was on night duty. His regular hours were from 8 P. M. to 9 A. M.—thirteen hours of regular nightly duty. But it further appeared that he very often was *obliged to remain at his post twenty-five and sometimes thirty-seven hours consecutively.* Last Saturday afternoon he asked leave to go home and was refused. Sunday afternoon—whether still on duty or not does not appear—he was taken ill and

DIED IN AN HOUR

—went, let us hope, to a world where telegraphing is conducted, if at all, on slightly different principles. A post mortem examination showed that the deceased was suffering from consumption, and

DIED FROM EXHAUSTION.

The foreman stated that the jury wished to express their opinion that, after the evidence brought before them, the system of labor in the postal-telegraph offices ought to be remodeled, the present system being

PRODUCTIVE OF MANY EVILS.

It is evident that the jury were carried away by their sympathies, and took a purely sentimental view of the question—a fault to which British juries are not liable. Possibly they had heard that the common nick-name for officials who have the pleasure of serving under Mr. Scudamore is

"POST-OFFICE NIGGER"

—a term which explains itself. To a certain extent we can excuse them, and we feel, no doubt, a proper regret that James Whitaker's constitution should have proved unequal to the strain put upon it by regular work varying from 13 to 37 consecutive hours in a Government telegraph office under the management of Mr. Frank Ives Scudamore. But then we, having time to think over the matter coolly, and having Mr. Scudamore's financial report before us, are bound to look at the matter practically. Let us put ourselves in Mr. Scudamore's place, and reason as he must be supposed to reason. He would say to himself,

MY REPUTATION

depends on the financial success of the postal telegraphs. I have irritated the business community by

EIGHTEEN MONTHS OF MISMANAGEMENT.

There have been delays, blunders, vexations of all sorts to them, and without number. But perhaps I can make it appear that the Government scheme is not a failure financially as well as in other respects. So by working James Whitaker and his fellow clerks from 13 to 37 hours consecutively at

STARVING WAGES,

a certain percentage of expense (not chargeable to construction account) has been saved, and perhaps even a portion of Mr. Scudmore's reputation as a Post-Office administrator has been saved also. If the jury had considered this, they surely would not have wished to interfere with the existing system.

OVERCHECK.

OWANAWUX, Ills., 1871.

To the Editor of the Journal of the Telegraph:

Would like a reply through the JOURNAL to the following: In case an operator overchecks his office by using the wrong tariff and remits accordingly, is he not entitled to receive back the difference that is in his favor from the Company when accounts are audited.

Ans. Whenever evidence is furnished of an overcheck the amount is allowed.

THE Galaxy says that the reason the Russians are so slow in availing themselves of the electric telegraph is because of their aversion to the *elevation of the Poles!*

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
August 15, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since August 1, the date of the last tariff order.

Managers are hereby required to enter these changes in their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

338 Addieville, Ill.
429 Aurora, Mo.
• Arcade, N. Y.
Big Trees, Cal. Tariff same as Placerville, Cal.
• Copenhagen, N. Y.
267 Chehaw, Ala., re-opened.
40 Catskill Mountain House, N. Y.
83 Clayton, Del.
Enniskillen, N. B. Tariff same as Fredericton Junc., N. B.
348 French Village, Ill.
Harvey, N. B. Tariff same as Fredericton Junc., N. B.
383 Harrison's Sta., Miss.
130 Henderson Farm, Pa.
• Herman, N. Y.
312 Iuka, Miss., re-opened.
266 Jacksonville, Ala., re-opened
202 Lick Run, O.
77 Laurel, Md.
• Mt. Holly Spgs., Pa.
• Ocean Grove, N. J.
• Pine Grove, Cumberland Co. Pa. P. O. Adds. Maintain Creek.
328 Patoka, Ill.
383 Quitman, Miss.
94 Riverside, Pa. Check Danville, Pa.
• Russell, N. Y.
236 Stone Mtn., Ga., re-opened.
Stockton, Utah. Tariff 50 cts. more than Salt Lake City.
361 Sunny Side, Ind.
25 Thompson, Conn.
337 Tower Hill, Ill.
Tracy, N. B. Tariff same as Fredericton Junc., N. B.
101 Wallace, N. Y.
76 Womelsdorf, Pa.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Arcade, N. Y.,	40	3	Buffalo, N. Y.
Copenhagen, N. Y.,	25	1	Utica, N. Y.
Fox River, Que.,	30	2	Send and check via most direct route.
Herman, N. Y.,	Same as De Kalb Junc.		Same as De Kalb Junc, N. Y.
Mt. Holly Spgs., Pa.,	25	2	Carlisle, Pa.
Ocean Grove, N. J.,	20	2	Long Branch, N. J.
Pine Grove, Cumberland Co., Pa, P.O. Adds. Maintain Crk,	25	2	Carlisle, Pa.

OFFICES CLOSED.

Ackworth, Ga.; Adairsville, Ga.; Black Buttes, Wy.; Berkshire, Mass.; East Douglass, Mass.; Hopewell, N. Y.; Ogallala, Neb.; Pine Bluffs, Wy.; River Phillip, N. S.; Wetumpka, Ala.; and all offices on Alabama and Chattanooga Telegraph Line given in JOURNAL of July 15, 1871.

GENERAL INFORMATION.

Offices in Eastern and Southern Divisions will hereafter check Evansville, Ind., direct, square 300. Offices in Central Division will continue to check as heretofore, until further notice.

The name of the office heretofore known as Brasher Falls, N. Y., has been changed to Stockholm Depot.

The post office address of Livingston, Va., is Montrose, Va.

The tariff to Fishkill Village, N. Y., is 30 and 2; "other Lines" from Fishkill. Many offices check at same rate as Fishkill, which is incorrect.

Florence, Ks., will hereafter be in square 118.

The tariff to square 118 is 20 cents more than square 466.

ATLANTIC CABLE BUSINESS.

Messages for India and beyond cannot be taken without signature.

COCHIN CHINA.

Direct communication is now open to Saigon and all parts of Cochin China. Rate *from London*, $29 25 for 20 words. Half-rate for each additional 10 words.

WILLIAM ORTON, *President.*

HOUSEHOLD MOTORS.

No invention for household use would meet with more ready favor, or do more good, than a motor capable of working up to a power equal to that of a person of average strength. An obvious use for such an engine would be found in running sewing machines, working washing machines, operating dumb-waiters, and the like, and, once successfully introduced, there would undoubtedly be a rapid succession of new vegetable washers, dough-mixers, graters, and other appliances especially designed for having their cranks turned by a steam piston instead of a human elbow-joint. For such uses, a caloric engine is not, as might at first be supposed, at all adapted, and the electrical engines hitherto introduced are too expensive and too much in the nature of scientific toys. Windmills are too variable, and besides cannot be adopted at all in cities, which last objection will also apply to the somewhat unreliable canine who does frequent duty in operating churns in rural districts, where, by the way, it would be well if he were substituted by some motive power wholly destitute of his peculiar faculties of indolence and independence. There seems no system, other than that of steam, upon which an engine of the class needed can be made. The difficulty of providing such a motor is more apparent than real, if we believe the reports current a year or two since concerning the success of very small steam engines, driven by the heat of gas jets and applied to light service of various kinds. An engine of one-tenth of one horse-power was described some time ago in the French journal, *Les Mondes*, as running to its full extent with a consumption of seven hundred litres, or about twenty-five cubic feet of ordinary coal gas per hour. At New York charges for illuminating gas, this would be seven and one-half cents per hour, and when it is considered that the power is used as a direct substitute for manual labor, the cost cannot be thought excessive; still better results are claimed for other apparatus of the same class. An engine described some months since in a paper read before the British Association of Gas Managers, was set forth as furnished with a vertical tubular boiler, heated by an annular series of gas burners, and with which it was claimed one horse-power could be maintained by the consumption of one hundred cubic feet of gas per hour.—*American Artisan.*

◆

Computations of the solar energy wasted on the vast area thus specified would present an amount of dynamic force almost beyound conception. Let us, therefore merely estimate the mechanical force that would result from utilizing the solar rays on a strip of land, a single mile in width along the rainless western coast of America; the southern coast of the Mediterranean before referred to; both sides of the alluvial plain of the Nile in Upper Egypt; both sides of the Euphrates and Tigris for a distance of 400 miles above the Persian Gulf; and, finally, a strip one mile wide along the rainless portions of the shores of the Red Sea, before pointed out. The aggregate length of these strips of land, selected on account of being accessible by water communication, far exceeds 8,000 miles. Adopting this length and width of one mile as a basis for computation, it will be seen that the assumed narrow belt of the sunburnt continents covers 223,000 millions of square feet.

◆

Avon, N. Y., Aug. 10, 1871.

To the Editor of the Journal of the Telegraph:

I notice by each issue of your valued paper that the sons of Father Morse are increasing rapidly. I am happy to announce that I am not behind the times, but have been favored with one of the Professor's children, a fine boy, born July 30, 1871, weighing nine pounds.

Wm. H. Griffith,
Manager.

TELEGRAPHERS' MUTUAL LIFE INSURANCE.

RECEIPTS—ASSESSMENT NO. 21.

26 27 31 34 49 54 55 58 61 67 70
74 76 78 84 86 89 91 96 106 114 120
127 139 142 144 150 153 162 169 171 172 176
206 217 218 227 228 237 239 246 252 253 254
259 275 288 289 298 305 318 333 336 354 356
357 359 362 364 366 367 382 397 402 414 41
423 430 431 433 435 437 443 450 459 461 462
466 467 468 469 470 471 474 475 477 481 514
524 527 528 546 562 566 570 575 576 581 583
586 590 605 615 619 629 631 639 660 661 662
663 664 666 669 676 684 694 695 712 717 725
7 6 730 731 732 733 749 750 751 766 771 787
791 801 808 814 822 831 850 851 856 868 869
871 878 882 899 908 911 920 935 948 949 1011
1028 1038 1041 1043 1044 1064 1069 1092 1142

Assessment No. 22.

5 6 7 13 16 21 26 28 30 34 46
54 56 59 60 72 78 83 88 98 99 101
107 113 114 123 129 131 133 134 145 157 171
175 176 177 178 185 186 187 192 201 202 206
209 217 227 231 240 244 247 254 257 259 262
263 264 265 266 267 269 274 275 276 277 278
279 280 281 282 283 285 287 291 301 304 312
318 333 341 344 349 350 351 362 379 380 383
385 405 406 418 423 426 450 459 476 510 520
533 536 547 548 549 553 576 577 581 584 586
587 604 608 617 618 632 636 646 648 656 659
662 663 664 665 666 669 678 679 680 685 686
695 697 703 716 730 731 732 733 734 736 740
772 773 775 776 787 790 797 800 803 804 812
820 821 822 830 833 848 874 901 910 922 930
931 935 938 945 947 952 966 978 995 998 1000
1009 1017 1019 1029 1035 1039 1040 1043 1044 1045 1047
1048 1049 1053 1054 1055 1062 1063 1066 1071 1073 1074
1075 1076 1080 1087 1088 1093 1095 1096 1103 1105 1106
1107 1108 1109 1110 1111 1112 1113 1114 1115 1118 1119
1120 1121 1122 1123 1124 1127 1128 1130 1131 1132 1148
1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1166
1167 1169 1170 1172 1175

◆

We offer no apology for publishing the following. It breathes the right feeling, and is but the echo of other hearts:

Gerrit Smith, Esq.:

Dear Sir: Inclosed please find one dollar, my assessment on account of the death of Mr. Marriott, with kindest sympathy for the bereaved.

Death enters our ranks, and cuts down one after another of our little band; and with each succeeding one we are led to realize more clearly the great blessing which our Association has proved, and is proving, to many, not alone to those who are pecuniarily benefited in their hour of need (and this cannot well be measured), but to those who are permitted to contribute to this end, for the enlargement of heart and increase of fraternal feeling which results therefrom, and which renders us better men and women, and, consequently, better members of our profession.

God bless those who have so kindly and faithfully labored for the past three years in this work of love (without remuneration except that which results from a consciousness of doing good), and give them the support they deserve and need!

I earnestly hope the officers of our Company (of whom we are justly proud) will be induced to join our Association, thereby giving it their moral as well as pecuniary support, and which, I doubt not, would influence many telegraphers, who are still holding themselves outside our loving circle, to enter in and be one with us in this work of mutual kindness and good will.

Personally thanking you and Mr. Reid for all you have said and done for us in this and other directions,

Very respectfully, E. Sammis.

Quarantine, S. I., Aug. 8, 1871.

◆

Queensland Telegraphy.—The Queensland Government has completed a telegraph line as far as Cashmere, the first station on a line to the Gulf of Carpentaria, and 50 miles from Cardwell.

RESPONSE TO "HOW TO COLLECT A KISS."

The Saxon proverb is true,
  No one can deny it,
To steal a kiss, and see the effects,
  Just you go and try it.

"A kiss for a blow always bestow,"
  Is very nice in its place,
But you steal a kiss and off you go
  With a smack across your face.

"If you want a kiss why take it,"
  The consequences never fear,
'Tis surely a bliss to steal a kiss,
  And go spinning on your ear.

"If you want a kiss why take it,"
  He's a coward that always lurks,
The cowardly spell for once do break it,
  Just to see how the old thing works.

"If you want a kiss why take it,"
  Don't be such a silly elf.
There's a challenge—dare you take it?
  Well! "you know how it is yourself."

"O."

ANSWER TO HOW TO COLLECT A KISS.

There's a tale the Journal told us
  In a sweet poetic way,
How a poetess would reward us,
  If her challenge we'd obey.

Never, never should another
  Get the best of me in this,
Tho' at Cupid's shrine a brother
  I by stratagem might kiss.
Do not call it vile ambition
  To be self in such a case;
Since it is a nymph's tuition
  I the offer would embrace.
Ne'er, decline a *noble* calling,
  One so clear you can't mistake it,
Take the ladies' challenge bravely,
  If you want a kiss, why take it.

Better far than "face a cannon;"
  Sooner far than win a crown,
Would I win a noble woman
  I might bravely call my own;
Shall I find her—here's the query,
  Loving, jolly, all alive,
True and *Noble*, good and merry—
  At "a hundred and forty-five?"
There amongst electric misses
  May I clasp a hand and shake it,
And enjoy that bliss of blisses—
  To want a kiss and take it.

Fare thee well, dear loving maiden,
  Skilled in baffling time and space,
Oh! a precious gem is laid in
  Store for him who'll thee embrace.
May love's spirit ever guide thee
  Thro' a calm and happy life,
Till some kindred soul beside thee
  Claim a truthful, loving wife.
Then in some sweet home reposing,
  Bright as Heaven itself could make it
To that other self disclosing,
  If he wants a kiss to take it.

Lismaine.

New York, Aug. 7, 1871.

◆

BORN.

To C. H. King, Manager W. U. T. Office, Mitchelville, Iowa, July 28, a daughter.

To J. A. Swift, operator in Storm-signal office, Washington, morning August 8th, a son.

MARRIED.

BULLOCK—KETCHAM—At Northport, July 30, by the Rev. S. G. Law, Wm. S Bullock, Manager W. U. T. Office, Northport, to Miss Nettie Ketcham, all of Northport. No cards.

LANE—MUNGER—On July 24, at the house of the bride's father at Maquoketa, Iowa, Mr. Geo. M. Lane, Manager Erie & W. U. T. Offices, Suffern, N. Y., to Miss Luella Munger.

Carl Lee—Mullins.—At Clarendon, Ark., Tuesday, Aug. 1st, by the Rev. —— Baker, Mr. Ed. S. Carl Lee, manager W. U. Telegraph office, Clarendon, to Miss Sue F. Mullins. No cards.

DIED.

Andrews.—At East Albany, N. Y., July 29th, 1871, Georgeanna Gilliam, formerly of Williamsburgh, Va., wife of M. S. Andrews, late manager of W. U. office, East Albany.

Western Union Telegraph Company.

PRESIDENT—William Orton.

VICE-PRESIDENTS.

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George Hart Mumford, *Secretary*.

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Initials of Roads and Names marked on Glass.

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FACTORY, 53 CENTRE ST.,
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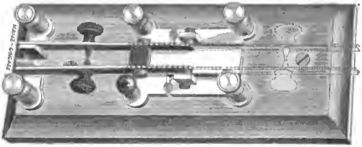

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SMALL SOUNDERS,

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With instructions for putting up and operating.

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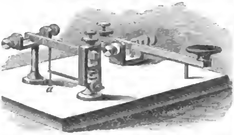

For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

It should be introduced into every school and family where there are those who wish to learn the Art.

Hundreds of persons throughout the country desire to become expert Telegraphists, and are constantly seeking permission to practice in the various telegraph offices.

This instrument is an outgrowth of this pressing demand. The Inventor is himself a practical operator, now in active service. Operators and others wishing to teach or learn the Art, will be delighted with this instrument.

It can be placed anywhere, as it does not occupy a space more than six inches square.

Its cost is but $7, and there is no expense whatever to keep it constantly in working order.

We will send a copy of SMITH'S MANUAL, free of charge, with each instrument, to individuals or clubs. The instructions in this Manual are particularly adapted to those who wish to learn by sound.

Special and liberal terms to manufacturers.

Remittances can be made by certified draft on New York, Cleveland, or Pittsburgh, money by express, charges paid, post office order, or registered letter at our risk.

Parties ordering instruments, from points except well-known cities, will please give the name of county and State.

Price, $7. Silver Plated, Extra Finish, $10.

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Telegraphers'

Mutual Life Insurance Association.

INCORPORATED UNDER THE LAWS OF THE STATE OF NEW YORK.

I. This association shall be known as the Telegraphers' Mutual Life Insurance Association, and be organized under the general State law of the State of New York.

II. Its officers shall consist of a Treasurer and Secretary.

III. There shall be an Executive Committee of five, of which the Treasurer and Secretary shall be members, who shall exercise a general supervision over the affairs of the association and decide all questions which may arise.

IV. No officer shall, at present, receive any remuneration for his services.

V. No expense of any kind will be allowed except for expenses of incorporation, stationery, postages, circulars, certificate and advertising.

VI. Any person, regardless of sex or class, may become a member of this association provided they are or have been employed in the telegraph business and subscribe to these articles, and are unobjectionable to the Executive Committee.

VII. The initiation fee shall be one dollar and fifty cents, one dollar of which shall go to the contingent fund, and the balance to the expense account.

VIII. Upon the death of a member the Treasurer shall immediately, on application by the proper parties, pay over to them the fund which is on hand for that purpose, that is, the whole of the contingent fund on hand from the previous assessment.

IX. It shall be the duty of each member of this association to leave in writing, the name of his or her executor or heir, failing to do which the amount of insurance shall be used, first, to pay the expenses of burial, and the balance to be given to such relations of the first degree as are dependent on the deceased, or should there be none such, to be subject to the disposition of the Executive Committee for the benefit of the association.

X. Immediately on the decease of a member, the Treasurer shall assess each remaining member $1, payable within thirty days of the issue of the assessment call, neglecting to pay which during the time specified, the delinquent shall forfeit all claims to membership or the benefits of the association, and he shall be restorable only on the unanimous vote of the Executive Committee and the payment of dues.

XI. A meeting for the election of officers shall be held annually during the first week in November in each year, who shall be elected to serve for one year or until their successors are elected. In case of the death of a member of the Executive Committee the remaining members shall have the power to fill the vacancy until the time of the annual election.

XII. Special meetings of the association may be called upon the written request of twenty-five members.

XIII. It shall be the duty of the Treasurer to receive all moneys, sign receipts, and pay bills and claims when audited by the Executive Committee. He shall give suitable bonds for an amount equal to twice the amount of money on hand at the time of his election.

XIV. The Secretary shall keep the records of the association, maintain such correspondence as is necessary with members, and issue such notices as may be necessary. He shall also aid the Treasurer in all matters in which he may require assistance.

XV. Certificates of membership shall be given, signed by the Treasurer and Secretary.

XVI. The books of the association shall always be open for examination by any member thereof.

J. D. REID, Treasurer.

GERRITT SMITH, Secretary.
A. S. BROWN,
W. H. HILL,
D. R. DOWNER,
Executive Committee.

DIRECTIONS TO APPLICANTS.

1. The number admissable as members of the Association at any one time, having been limited for the present to *fifteen hundred*, it is necessary to apply early if membership is desired.

2. Apply by letter, *enclosing one dollar and a half and a three cent postage stamp for each application*, to Gerritt Smith, Secretary Telegraphers' Mutual Life Insurance Association, 145 Broadway, New York, and a certificate of membership will be sent by return mail.

3. Every applicant must be known to the Executive Committee, or to some responsible Manager of a Telegraph Office, and evidence of this, and of good character and of ability to work, must accompany each application. The endorsement of a reputable Manager will be regarded as denoting eligibility as stated, and the signature of the applicant, with date, amount and recommendation, will be all the form of application necessary.

4. Each applicant must file with the Secretary written directions respecting the disposition of the money to which he or she may be entitled at death.

5. No letters can be answered unless a stamp is enclosed for postage; and as the officers labor without compensation, correspondence requiring answers should be as limited as possible.

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OPINIONS.

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Associate Editor of the "Telegrapher."

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They are now prepared to fill promptly any orders for goods on hand, or to be manufactured, at Mr. BISHOP's prices in New York.

The long experience of Mr. BISHOP in the manufacture of

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and the reputation he has gained and enjoys for the superior quality and perfection of manufacture of his

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of various kinds, insulated with pure Gutta Percha, renders this arrangement a very important one for our numerous patrons throughout the country, and we confidently recommend these goods to their especial notice as being fully equal, if not superior, to any other in use.

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Gutta Percha Covered Telegraph Office Wires, in great variety of size and style.

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Subterranean Wires with Gutta Percha and braided fibre, and Bishop's Patent Compound outside.

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Cotton and Silk-Covered Wires, both twist and braided.

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We would call your attention to our

TELEGRAPH OPERATORS' BADGE PIN.

Having completed our arrangements to manufacture, by putting in new machinery, and with a full force of workmen, we are now ready to supply the GREAT DEMAND for these Badge Pins. They are made of 18k gold, and are perfect fac-simile of the present MORSE, or curved lever keys, and the new style WESTERN UNION straight lever and FANCY BASE KEYS. We are now making two different sizes, one to be three-quarters of an inch long, and the other one inch long. Also, a very small, neat, BADGE KEY PIN for LADY OPERATORS. These are the only badge pins ever got up exclusively for Operators.

We are, also, manufacturing a complete set of RAILROAD BADGE PINS, for CONDUCTORS, BAGGAGE-MASTERS, BRAKEMEN, STATION AGENTS, and others, consisting of Punches, Passenger Cars (Pullman's Palace Pattern), Switch Targets, Coupon Tickets, &c. These Badges are all made of the most approved patterns.

PRICE LIST.

Key Pin, oval base, one inch long	$6 00
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Key Pin, fancy base, one inch long	7 00
Key Pin, fancy base, ¾ inch long	6 00
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Key Pin, fancy base, (for Lady Operators)	6 00
Key Pin Charm (for Watch Chain)	$5 00 and 6 00

☞ The above are made with straight or curved Levers. ☜

Conductor Punch Pin	$4 00
Passenger Car Pin (Pullman's Palace Pattern)	6 00
Switch Target Pin	4 00
Coupon Ticket Pin (enamel)	4 00

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Persons ordering Key Pins, be particular in giving style of lever and base wanted.

Any of the above will be forwarded by express, C. O. D., or by mail, registered, by sending amount and twenty-five cents extra to pay postage and registration fee.

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PITTSBURG,
LOUISVILLE,
ALLEGHANY,
MONTREAL,
QUEBEC,

PORTLAND,
ST. JOHN, N. B.,
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KENNAN AND ABASA AMONG THE KORAKS.

MEMORIES OF THE OVERLAND TELEGRAPH.

Two hundred dogs, eighteen men, sixteen sledges, and forty days' provisions, formed the material of the expedition to the land of the Wandering Koraks, commenced by Mr. Kennan and Major Abasa on a day in November, and whose first danger was the descent from the summit of the Samanka Mountains to the dreary expanse of snow, two thousand feet below. The long northern twilight faded into the steely blue of an Arctic night; the moon rose, and threw the shaggy outlines of the great peaks into strong relief. In the ravines below, the dense thickets were full of the gloomy indistinctness of night. Into that gloom and indistinctness the travellers must plunge; so they rouse up their dogs, and are off into the mouth of a ravine which leads to the steppe.

Could the wild legend of the Phantom Horseman produce a wilder picture than this one: * "The deceptive shadows of night, and the masses of rock which choked up the narrow defile, made the descent extremely dangerous; and it required all the skill of our practiced drivers to avoid accident. Clouds of snow flew from the spiked poles with which they vainly tried to arrest our downward rush; cries and warning shouts from those in advance, multiplied by the mountain echoes, excited our dogs to still greater speed, until we seemed, as the rocks and trees flew past, to be in the jaws of a falling avalanche, which was hurrying us with breathless rapidity down the dark cañon to certain ruin. Gradually, however, our speed slackened, and we came out into the moonlight on the hard wind-packed snow of the open steppe. The disturbed, torn-up condition of the snow usually apprises the traveller of his approach to the haunts of the Koraks, as the reindeer belonging to the band range all over the country within a radius of several miles, and paw up the snow in search of the moss which constitutes their food. Failing to find any such indications, we were discussing the probability of our having been misdirected, when suddenly our leading dogs pricked up their sharp ears, snuffed eagerly at the wind, and with short, excited yelps, made off at a dashing gallop towards a low hill, which lay almost at right angles with our previous course. The drivers endeavored in vain to check the speed of the dogs; their wolfish instincts were aroused, and all discipline was forgotten as the fresh scent came down upon the wind from the herd of reindeer beyond. A moment brought us to the brow of the hill, and before us, in the clear moonlight, stood the conical tents of the Koraks, surrounded by at least four thousand reindeer, whose branching antlers looked like a perfect forest of dry limbs. The dogs all gave voice simultaneously, like a pack of fox-hounds in view of the game, and dashed tumultously down the hill, regardless of the shouts of their masters, and the menacing cries of three or four dark forms, which rose suddenly up from the snow between them and the frightened deer. The vast body of deer wavered for a moment, and then broke into a wild stampede, with drivers, Korak sentinels, and two hundred dogs in full pursuit." What a sight that must have been, when the dark silent tents suddenly swarmed with life, and tall dark forms joined in the chase, shouting, and hurling lassoes of walrus-hide at the dogs; when thousands of antlers dashed together in the confusion of flight; when countless hurried hoofs bent the hard snow, and the hoarse deep barks of the deer added themselves to the frantic baying of the dogs! When the deer and the dogs had been reduced to submission—"when the tumult dwindled to a calm"—the American travellers turned to the contemplation of the men before them, specimens of one of the strangest tribes numbered among the wild peoples of the earth—dwellers in the awful Siberian wastes, but yet a kindly, honest race—the Wandering Koraks.

The conditions of their existence are terribly hard, but they are not stunted or puny, like the Esquimaux, but athletic, able-bodied men, of the average height of Europeans, with coal-black hair, bold, alert eyes, and high cheek-bones. Their costumes and equipments must have looked very picturesque in the moonlight, in that far-off corner of the world. "Heavy hunting shirts of spotted deerskin, confined about the waist with a belt, and fringed round the bottom with the long black hair of the wolverine, covered their bodies from the neck to the knee, ornamented here and there with strings of small colored beads, tassels of scarlet leather, and bits of polished metal. Fur pantaloons; long boots of sealskin, coming up to the thigh; and wolfskin hoods, with the ears of the animal standing erect on each side of the head, completed the costume. Each man was armed with a long bright spear." The conical tents which form the camps of the Koraks are very ingeniously constructed. They are formed of a framework of poles, covered with loose reindeer skins, confined in their places by long thongs of seal or walrus hide, stretched tightly over them from the apex of the cone to the ground; the severest gales cannot tear these coverings from their fastenings. The first camp seen by the travellers consisted of four of these tents, around which neatly constructed sledges were scattered here and there upon the snow; two or three hundred pack saddles for the reindeer were piled up in a symmetrical wall near the largest tent.

MAJOR ABASA ENLIGHTENED BY A KORAK.

Mr. Kennan gives an amusing instance of the contempt with which they treat the notion of difference of rank and inequality of condition. Major Abasa, the chief of their expedition, had, he says, conceived an idea that, in order to get what he wanted, he must impress them with a notion of his power, wealth, and importance in the world. 'He accordingly called one of the oldest and most influential members of the band to him one day, and proceeded to tell him, through an interpreter, how rich he was, what immense resources in the way of rewards and punishments he possessed, what high rank he held, how important a place he filled in Russia, and how becoming it was that an individual of such exalted attributes should be treated by poor wandering heathen with filial reverence and veneration. The old Korak, squatted upon his heels on the ground, listened quietly to the enumeration of all our leader's admirable qualities and perfections without moving a muscle of his face; but finally, when the interpreter had finished, he rose slowly, walked up to the major with imperturbable gravity and with the most benignant and patronizing condescendsion, patted him softly on the head! The major never tried to overawe a Korak again.'

**A*dventures Among the Koraks.* By George Kennan.

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RAILROAD SIGNALS.

From the Railroad Gazette.

It is becoming an important matter to know how to carry the greatest possible number of trains on a double track with safety and economy. The world's great centres of busy life and industry are throwing yearly an increasing business on the great main iron arteries which connect them with minor cities and surrounding districts. How to make some railroads carry double and treble what it was originally estimated they would have to carry has been a question thrust home to the minds of many intelligent railroad men, and not without a successful solution. Instead of building a third or a fourth track, which would have involved an outlay incommensurate with the work to be done, they have solved the problem in another manner, and thus have increased very considerably the capacity of the iron track and locomotive combined.

This result has been attained by the elaboration of a complete system of semaphore and electric signals. What eyes are to a human being, signals are to a railroad. Let these be imperfectly or wrongly used, and the result is hesitation, uncertainty of action, and disaster. The city of London to-day, from the nature of the conditions to be complied with, and the enormous traffic ebbing and flowing from it, has taxed the energies and brains of railroad managers to produce a system that would enable them to operate the traffic of these roads with safety and economy. Some suburban lines carry 400 to 600 trains per day, and main roads radiating into the heart of the country carry from one hundred upwards, comprising trains of every description, from the fast express at fifty miles per hour down to the long and ponderous coal train.

At every depot a signal post from thirty to sixty feet high is erected, carrying two semaphore arms at the top painted red on the side from which the signal is to be observed, one arm being applied for each track. When extended at right angles to the post, just as a man extends his arm straight out from the shoulder, this indicates that the train must be brought to a stand before reaching the signal, and no engine-driver dare pass it, under penalty of a fine or dismissal. When lowered half-way down, to an angle of forty-five degrees, this indicates caution; and when let down so that the arm is hidden within the post, the road is signaled as all clear, and the train may proceed at full speed. Lamps placed upon the post which show red, green or white, corresponding to the three above positions of the semaphore arms, serve as signals during the night. In most cases, in the neighborhood of London, such lamps are lighted with gas and show a very intense light. Standing at a point about two miles from Clapham Junction, where some eight or ten roads intersect and radiate in different directions, some thirty or more of these signal lamps may be seen fiercely blazing with the red or danger lights, which are only turned to green or white momentarily to allow the passage of some passing train or trains.

In addition to the main signal post at the depot, what are called auxiliary posts are placed from half a mile to a mile on either side of it. These are worked by wires carried into 'the signal box of the man who works the main signal, are often of great height, and can be seen for two miles before reaching the depot, so that should switching be going on of any kind, the main track can be blocked to prevent fast trains running into stray wagons or freight trains.

Still further, however, on the heaviest worked roads, to insure punctuality and safety, what is known as the "block system" is introduced. To illustrate this, let us take the first eighty-two and a half miles outward of the London & Northwestern Railway—that is, from its London terminus, Euston, to Rugby. This company owns 1,500 miles of double track, much of it laid with steel rails, eighty-four pounds to the yard, has expended $270,000,000 on its road, owns 1,800 locomotives, turns out from its own machine shops a new locomotive every third or fourth day, manufactures its own Bessemer steel, and rolls its own rails. Its earnings are about $750,000 per week, or say $500 per mile per week. It can easily be imagined that its main stem is very heavily crowded with trains. Some twenty-five or more run over this eighty-two and a half miles, without stopping, in one hour and fifty-five minutes or two hours. The whole number of trains is over one hundred, including every variety. The "block system" is in force along the whole line, in addition to the seramphore signals at every depot. Every three miles is placed a signal box or hut, at which is stationed a signal man provided with red, green, and white lamps and flags. A single telegraph wire communicates from box to box. Each box contains two instruments, one for each track connected with the incoming and outgoing wire, and each instrument is possessed of two keys. Pressing down one key of the outgoing or forward wire brings opposite a slot, both of its own and of its immediate neighboring instrument ahead, a piece of pasteboard, on which is printed in red letters, "line blocked," and pressing down the other key of the same instrument brings opposite another slot in its own and the same contiguous instrument a slip of pasteboard with black letters on white ground showing "line clear." The same arrangements hold good for the wire leading in the opposite direction.

Suppose, therefore, a train to pass *A* going toward *B*. After giving the proper signal with the flag or lamp to the engine-driver, according to whether it is day or night, *A* puts his finger on a key of the instrument whose wire leads to *B*, and immediately his own and *B's* dial read "line blocked." This intimates to *B* that a train is traveling towards him, between his own and *A's* box. *A* has no power to release the signal on his dial; only *B* can do that, and his instructions are not to do so until the train has passed him. Immediately this is the case, he puts his finger on the key and his own and *A's* dial read "line clear." Until he gets this signal, *A* would not allow another train to pass him going towards *B*. In this way a space of three miles is preserved between all trains, whatever their character or speed. As the line is well fenced and no level crossings exist, all common roads being carried either under or over the railroad by bridges, the effect is to give the engine-drivers entire confidence. When a man gets an all-right signal at any box it indicates to him that the road is clear for three miles ahead, and all he has to do is to look for signals. Such indications are as valuable to him as the friendly light-house is to the storm-tossed mariner.

Incidentally, it may here be remarked that the plan of keeping a certain definite distance between all trains on crowded lines is the only safe one. An interval of time allowed to one train before allowing another to depart is not an absolute guarantee of safety. Such a train may break down or come to a stand on its journey, and then, if it be on a curve or steep gradient, or there is a fog, or the rails are greasy from the effects of a shower, the second train may collide with the first before it can be brought to a stand. Whereas, where a space of two or three miles is preserved between all trains, it is next to impossible that a collision can occur from one train overtaking another.

Another feature in the system is that of the "break-down wire," as it is called. This is the bottom wire of the telegraph (there being one for each track), which is brought down within about five feet of the ground on about every fifth post, and up again, so as to preserve the circuit; but which, if broken, instantly shows on two instruments, one at the depot on either side, that such is the case. In the event of a breakdown to any train, the conductor instantly runs, therefore, to the nearest post where the wire is brought down within reach, and with a pair of nippers which he always has at hand, breaks it in two. This being instantly notified by the instruments at the depots on either side, the necessary help can very quickly be supplied.

Another ingenious device is that for knowing when lamps placed on distant signal posts, out of sight of the signal man, become accidentally extinguished. Within the lamp is placed a piece of metal, which by its expansion caused by the heat of the flame brings its ends in contact within an electric wire. The circuit is then complete, and a current of electricity flows through it. In the signal man's box, on a table, is placed a miniature semaphore post with arms. By proper mechanism, operated upon by the same current of electricity as that which flows through the distant signal lamp, and which is carried by a wire connecting the two, the arm is kept down parallel with or within the post so long as the lamp is alight. As soon as the lamp goes out, however, the piece of metal contracts, contact is broken, the current ceases to flow, and the little arm flies out at right angles to the post and rings a bell. The signal man sees at a glance what is the matter, and goes or sends immediately to re-light his lamp.

Space prevents a very minute and detailed description of this beautiful system, which adds so much to the safety, security and economy of railroad working. Enough, however, has been written to give a general outline of it, and it is much to be desired that the same plan, or some modification of it, may speedily be adopted in this country. When the great bridge and tunnel and Union Depot are completed at St. Louis, it will be absolutely necessary for the operating of the vast traffic that will centre there, that a most complete system of signals of some kind be adopted, and no one can doubt that electricity will be the chief agent employed in the working of these.

Another matter deserving of more attention than has heretofore been given to it, is that of switches. The turning of these by isolated men, who run backwards and forwards from one to another, is neither safe nor economical. Many lamentable accidents have occurred through the wrong turning of a switch, more especially at depots which express trains pass without stopping. It has not unfrequently happened that the turnout has been left open instead of the main track, and the result has been death and destruction wholesale. The safest and most economical plan is that now largely adopted on English railroads—that of placing all switch levers at any depot under the care of a properly trained signal man, by placing them in a signal box, and giving to each turnout at that depot its own distinct semaphore arm and lamp.

The arrangement is as follows: Suppose the depot to be a junction or a terminal one; then at some point nearest to where the greatest number of switches may converge, a sort of gallery is erected right over the main track, high enough for all trains to pass underneath it and with glass sides both back and front, so that a good view is obtained up and down the track, as well as all over the depot ground. Inside this, in a long iron rack, a row of switch levers—that is, one for each switch—is placed, and each lever is duly labelled with a number on a brass plate corresponding to the number of the switch, which, possibly, may be a quarter of a mile distant. By means of bell cranks and iron rods, each lever is connected with its own switch. Above the roof of the gallery posts are erected which carry semaphore arms and lamps, one arm and its corresponding lamp for each switch. The switch lever works the signal arm or lamp, and the mechanism is so constructed that the arm will not fall from its normal position of danger, or the lamp change from red to green or white, until the switch is properly set to enter the turnout and locked in that position; at the same time, and by the same movement, the arm or lamp for the main track is also locked to a position indicating danger or stop, and cannot possibly be moved until the switch has been reversed to a position of safety for the main track, and its arm or lamp placed to indicate that the turnout is closed. No difficulty is found in communicating from the conductor of a train or an engine-driver to the signal man as to which turnout he wishes to enter. A certain number of soundings of the whistle, a waving of a hand-lamp or flag, enables them to do this, and whilst a freight or other train may be shifting or sorting its various cars from point to point, the eye of the signal man in his box is ever up and down the main track, to keep it locked until he sees it all clear for an advancing train.

By this system there is a saving of labor, as well as a sense of security engendered amongst the employees, and it is an approach to what is so much to be desired on railroads as elsewhere—the substitution of self-acting mechanism for the varied kinds of human labor at present so absolutely necessary.

August 8, 1871. J. B. R.

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Mr. Varley's article on naked wire cables is unavoidably omitted, but will appear in our next issue.

ON THE DURATION OF FLASHES OF LIGHTNING.

BY O. N. ROOD.

After the completion of my first set of experiments on the duration of the discharge of a Leyden jar, I became anxious to make some measurements of the duration of a flash of ordinary lightning, which may be considered as equivalent to the discharge of an immense jar with an enormous striking distance. The results of Feddersen have shown that the duration of the discharge is increased by an addition to the size of the jar, as well as by augmentation of the striking-distance, and as both these quantities are so large with a flash of lightning, it was reasonable to expect that the duration of its discharge would be prolonged in some corresponding ratio. During the violent thunder-storm of last August, which occurred in the evening, I happened to be at a house commanding an unobstructed view of the horizon, and this circumstance, taken in connection with the frequency and proximity of the electrical discharges, induced me, although entirely unprovided with apparatus, to attempt a measurement of their duration. A circular disc, five inches in diameter, was hastily cut from white cardboard, while a steel shawl-pin served as an axis, on which it was made to revolve by constantly striking its edge tangentially with the right hand, the pin being held in the left. The *maximum* velocity attainable in this way was always employed. The general indications at the time were that the rate thus obtained was considerably more uniform than might have been expected, and subsequent quantitative experiments have confirmed this idea. The first experiments were made by observing black figures traced near the circumference of the disc, which was illuminated solely by the rapidly-recurring flashes, and it often happened that the figures, with their details, were seen quite as clear and sharply as though the disc had been stationary; on the other hand, sometimes the edges seemed blurred, as though the disc had moved through a few degrees during the act of discharge. The result being doubtful, the mode of experimenting was quickly changed; about fifteen narrow radial apertures were made near the circumference of the disc, and the flashes and illuminated clouds were observed through these openings, the disc being made to revolve as before. The distance of the eye from the apparatus was about 8 inches, and it was, of course, adjusted so as to obtain distinct vision of the disc. The result was that sometimes the openings were seen quite unchanged in appearance, but more frequently they were most distinctly elongated into well-defined streaks some degrees in length. They were observed often and without difficulty, but, as farther confirmation, I may add that I requested Professor Joy, who was ignorant of the actual form of the aperture, to state his opinion of their apparent shape while the disc was in rotation. The reply was that they resembled Prince Rupert's drops—a not unfair description of the phenomena in question. Repeated estimates of their size were then made with paper and pencil. Some time afterward I measured the velocity which I could communicate to this disc in the manner above described, by attaching to it a small hollow axis, through which the steel pin passed, the disc being then caused to wind up a thread stretched by a small weight. The rate of rotation thus attainable was found to be about twelve revolutions per second, which is a little more than I had anticipated. The average size of the streaks was 9°, corresponding to a duration of 1-480th of a second. It hence results that the duration of the flashes of lightning on the occasion referred to was, in round numbers, about 1-500th of a second, some of them, however, seeming to be confined to smaller limits.

I know of only a single circumstance which might militate against the correctness of the above conclusion, and it is but fair to give it such weight as it may carry. Becquerel has succeeded, with some difficulty, in observing a faint phosphorescence when an electric discharge is passed through rarefied air, and it is not absolutely impossible that the effects observed by me were due to a cause of this kind.

This point can hereafter readily be decided by observing with a revolving disc, not the distant clouds, but a sheet of white paper, placed so as to receive the light from the electrical flashes.—*American Journal of Science.*

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ELECTRO-MAGNETS.

M. le Comte Th. du Moncel has just issued the result of his inquiries into the best conditions of construction of Electro-Magnets. The numerous and important applications which these apparatus now receive, give to this book a great practical interest, whilst the involved problems of physical mathematics investigated by the learned author, will prove attractive to theorists. It is not sufficient to obtain from a distance a practically useful electric action, to have a source of electricity and a circuit, it is necessary to have an auxiliary to transform by a material action, the effect of the momentary circulation of the current of the circuit. This auxiliary is the electro-magnet. Since the discovery of Ampire and Arago, of wrapping wire helically around a core of iron, the construction of electro-magnets has been made the object of study by many able men. *Mr. Morse appears to have been the first who placed the electro-magnet in a conspicuous position in electricity.* It was MM. Leutz and Jacobi, celebrated Russian savants, who by numerous experiments, and by mathematical investigation, established the first rules of construction. They showed, first, the form of the electro-magnet is proportioned to the intensity of the current, and to the number of the conducting wires; second, that to place the electro-magnet in the best possible conditions in relation to the circuit in which they are interposed, it is necessary that the resistance of the coil should be equal to that of the part of the circuit foreign to the magnet.

A little later, Mr. Wheatstone, applying these deductions to telegraphy, changed completely the conditions of their construction, in making them of small dimensions, and employing fine wire. In this manner he obtained excellent results. But these two laws led to the result, that a very small mass of iron could become a source of indestructible force. M. Müller, believing in the impossibility of such a result, undertook numerous experiments, which led him to discover that not only is a mass of iron susceptible of a certain maximum amount of magnetism, but also that the law of Leutz and Jacobi is only true within certain limits of the magnetic condition of iron, and that even between these limits, the force of the electro-magnet is proportioned to the square roots of the diameter of the magnetic cores. M. Dub showed by other experiments that the force is also proportional to the square roots of the lengths, and as the attraction which results from this force decreases in proportion to the square root of the distance from the middle point of the magnetic core to the armature, it follows that the two laws of Dub and Müller combined, can be summed up in the following proposition: The attractive force of the electro-magnet on an armature is proportionate to the square roots of their length.

Lastly, M. du Moncel showed that he had in the electro-magnet a kind of magnetic condensation; he also replaced the solid iron cores with iron tubes, closed at the poles by iron buttons of the same thickness as the tube. The laws ruling electro-magnets being established in their simplest form, modifications of these laws, according to their practical application, were sought. A great number of works have been published on the subject by MM. Nicklés, Cecci, of Florence, Siemens, of Berlin, Jocelle, Hughes, Robinson, &c.

The work of M. du Moncel takes into consideration all the facts that have been collected, and corroborates them by mathematical investigation. Among the conclusions to which the learned author is conducted by calculation, we will mention the following:

To realize the maximum force in the case of a circuit perfectly insulated, and of an electro-magnet at the point of saturation, the coil should have a thickness equal to the diameter of the core, and a resistance double that of the exterior circuit. The length of each arm should be equal to six times the diameter, and the traverse, as well as the armature should have a length equal to that of the arms. Lastly, the armature should be prismatic and articulated, with a thickness a little less than one-fourth the diameter, placed with the flat side towards the poles. When the circuit is not completely insulated, or in the hypothesis of an inferior magnetic condition to that which corresponds to the point of saturation, these conditions are modified.—*Engineering.*

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In the theatres for several years electricity has been employed for the transmission of signals, to give the time to musicians placed out of sight of the musical conductor, and by the help of the apparatus of M. Duboscq, to light up any given part of the stage. M. Saint-Edme gives some interesting details of this latter application. He describes the means for obtaining rainbows, lightning, and illuminated fountains. He describes, also, the employment of magnesium and other lights, and the production of spectral and phosphorescent phenomena. Electricity gives very beautiful phosphoric effects, well known in physics by the Geissler tubes. These are utilized in the theatres in a variety of forms; for example, they are employed in the illumination of diadems and other insignia, in transformation scenes, and in the imitation of fireworks.

Thus, each day the practical application of electricity is extending, and for further information we refer our readers to the book of M. Saint-Edme, from which we have compiled the foregoing facts, in preference to making a formal review of the work.

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An Ingenious Device.—An exchange describes an ingenious apparatus now in use on the Chicago, Burlington & Quincy road, which employs electricity as an agent to assist in filling locomotive tanks with water. The steam pump which supplies the tank is situated on a stream half a mile distant, and entirely out of sight. A float is so arranged that, when water is drawn off more than two or three inches below the top of the tank, a circuit is closed connected by wires with the pump-house. This sets a bell ringing within hearing of the engineer, who starts the pump and runs it until the tank is full, which is duly announced by the cessation of the alarm. The application of a similar apparatus for the direction of lowness of water in stationary steam boilers might be made, we think, to answer a good purpose, by reminding delinquent engineers of their duty before it is too late to perform it.

NICHOLSON'S DOUBLE ALPHABET.

Mount Washington, Hamilton Co., Ohio.,
August 23, 1871.

To the Editor of the Journal of the Telegraph:

In your valuable paper of the 15th instant you have an editorial headed "Nicholson's Double Alphabet," and then speak of my plan for registering an entire *Morse letter* by a single action on two keys on a single wire. You are mistaken in regard to my claims. It is true that I can make the Morse alphabet on my instrument (using only one key, however, to make it); either the right or left key will make the Morse alphabet. The Morse alphabet is written on a single straight line, and hence only one key and one style or sounder is required to make it. Not so with my alphabet. It is written upon two straight parallel lines, and cannot be written upon one key, but requires a double key and two sounders to make it. The depression of the right key actuates the right sounder, the left key the left sounder, and when both keys are depressed both sounders respond. (A.)

The sounders are not "*on opposite sides of the operator receiving*," but are placed directly in front of him, side by side; the right sounder has a sharp sound, while the left is dull, so as to be readily distinguished by the ear from each other. There is no mental effort required in distinguishing the sound; the ear receives it, and its recognition is acquired by practice, similar to the Morse instrument. I am satisfied that it is much easier to read by sound than the Morse alphabet. (B.)

I cannot transmit signals with increased rapidity (I presume a dot is a signal, and so is a dash); however, I admit that I can transmit as fast. The point lies here—that less signals are required to make the entire alphabet on my instrument than on the Morse. Hence the operator is relieved to that extent, both in sending and receiving. I am glad to announce that I have another pocket in my pants—another "bottom dollar" is still there. (C.)

You say, by the present process, an operator can keep up with the fastest penman. If so, why are not all operators regarded as experts? Where are the operators that will keep Dick Duncan's pen in motion to its full capacity. (D.)

Your example in regard to the letter Z created some amusement with my operators. You are mistaken in regard to it altogether. In regard to the sound, I think, if you try the experiment by placing the sounders as we use them, you will admit that it is better and not so monotonous as the present system.

Respectfully yours, H. C. Nicholson.

"We believe such processes can never be popular." Do you mean the "*bottom dollar*," or my instrument? (E.)

H. C. N.

ANSWER.

We have no desire to speak unfavorably of Dr. Nicholson's device, or to deny its merits. We must be allowed, however, to express our conviction that it does not tend to simplicity or to any considerable saving of brain labor. Neither is it economic. At least so it appears to us. If we are in error, it is easy to prove it. Thus, in respect to machinery—

1. It requires two keys instead of one.
2. It requires two receiving magnets instead of one.
3. It requires two sounders instead of one.
4. It requires, presumably, two local batteries instead of one.
5. It probably requires resistance coils to utilize the one wire for two performances.
6. It probably requires a subsidiary main battery at every station.

There is certainly here no temptation to a company to adopt the Nicholson system, and this must be apparent to Dr. Nicholson himself.

A. We acknowledge ourselves in error in stating that it was the Morse signals which Dr. Nicholson makes by a single depression of two keys. It should have read Dr. Nicholson's signals. These are arranged on two lines, as by Steinheil, only that, instead of being all dots like his, dots and lines like the Morse is used. It is the Morse system on two parallel lines, with a new arrangement of the elements. The merit of the new system is that fewer signals are necessary.

Examples.

Morse A. Dot and line. Nicholson A. One dot on each of two keys, or one dot on each of two sounders.

Morse B. Line and three dots. Nicholson B. One line on right key and dot on left.

By admitting that, because two Nicholson signals, such as in the case of the two examples given, are made synchronously by one hand on two keys, it is therefore a single manipulation producing a complete letter, we, of course, admit that the alphabet is made complete by twenty-seven manipulations instead of eighty-one. Herein is the merit claimed, and which we do not desire to depress or deny. We also admit that, as the tone of the sounders are made to differ, the various related sounds which make up letters may be readily distinguished, although struck synchronously. So the amusement was justifiable and orthodox. The variety in sound had not occurred to us. There is, unquestionably, merit in this accomplishment. How much each must judge.

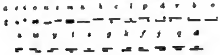
B. The mistake respecting the position of the sounders grew out of the description given to us. With variety of sound, their separation, as stated, is unnecessary.

C. We are glad to learn that the "bottom dollar" is still on hand

D. How many "Dick Duncans" are there? It will be found that more operators can write faster with the key than with the pen, so that the increased capacity to send is neutralized by the lesser capacity to receive. In this we may err. Such is our conviction.

Finally. When we remarked that "such processes can never be popular," we meant this, that any plan which proposes to a company to double its ordinary machinery without an actual increase of execution, or a clear prospect of doing so, will never be entertained. We also add that no process which requires a special education distinct from that necessary for the general service, and which would render the retention of operators necessary because thereof, and would disqualify them for the ordinary service, is likely, for the sake of introducing such a system as Dr. Nicholson's, to be accepted or encouraged. We say this, however, with this reservation, that until Dr. Nicholson's mode of utilizing the wire for two distinct performances is given us, we cannot fully appreciate his system. We understand Mr. Stearns' mode of using a single wire to send and receive at the same instant, and which the W. U. Telegraph Company is now employing on one of its important circuits, performing with the machinery of a single wire the work of two. We would like to know now the process by which double machinery on a single wire is used to make less laborious and more rapid the work of one.

NICHOLSON ALPHABET.



◆

IS THERE A CURRENT.

We have received the following anonymous note:

Dear Sir: Will you please explain in your next issue whether there is an electric *current* that *passes over the wire* on making connections, or if it acts on the same principle as filling a tube with water, and by forcing a drop in at one end, it forces one out at the other. That is, the wire is charged with electricity to its fullest extent, and, by adding any amount at one end, it displaced the same amount at the other. Will you please decide which is right, or if either is. Operator.

Ans.—The question has been so often asked, discussed, and answered, that to reply to it anew seems unnecessary; and yet so many hundreds of fresh workers are all the time entering telegraphic studies that the re-statement of familiar things is, perhaps, a duty which we have neglected. We shall answer the above query in the sensible statement of Mr. Cully, in the opening chapter of his valuable work, wherein he thus tersely says:

"It is customary to speak of electricity as if it had a distinct existence, and were an infinitely subtle fluid, capable of flowing as a current; or, as if there were two fluids, opposite in their nature, which can be separated by certain processes, and which, in the act of re-combining, produce the effects which are called *electrical*. These, however, are mere assumptions, for the purpose of simplifying explanation.

"It is now considered to be a peculiar force which causes the atoms or particles of matter to alter their position with respect to each other."

This seems all which can be said about the matter, without entering the wide discussion to which the question has given rise.

◆

To the Editor of the Journal of the Telegraph:

Will you kindly give your views on the following: A way office closes at 9 P. M. The press take the wire at 8.30. If a full-rate message is offered after press commences, but before 9 o'clock, does the Company require the operator to receive it, and wait in office till press is finished, and transmit it?

Yours, Inquirer.

This is a question which we can only answer affirmatively, because a message received during office hours, and its prompt transmission paid for at full rates, implies an obligation to do so. At the same time, we must refer to the disposition of the superintendents the arrangements by which the preferential use of the wire may be given for this class of business under such circumstances.

◆

Houston, Aug. 11, 1871.

To the Editor of the Journal of the Telegraph:

Some time previous to Mr. Varley's visit to the United States, and probably before Mr. Supt. Tubbs had thought of such a device, it was proposed to Gen'l Supt. Van Horn to place ground wires on every tenth pole between Houston and Galveston, to save them from destruction by lightning; and in this connection I desire to express the opinion that while iron posts are the "thing" in many cases, there is no economy in using them when good cedar may be obtained at from $1.25 to $2 each, and which, if necessary, may be saved from lightning in the manner above stated. Two good cedar poles are probably at least equal to one iron, in durability, and answer a better purpose.

Texas.

THE BROOKS' INSULATOR.

[*Extract from a letter of Mr. F. L. Vandenburg, dated Sacramento, July 30, 1871.*]

"If my lines showed the least escape I would follow your suggestions, but as they do not even in our fogs, which are worse than rain, I do not like to touch them."

The suggestions to him were, that his insulators might require cleaning and reparaffining, as they have been up four seasons, most of them on a nine hundred mile circuit, and without any such attention, the expense of which is trifling and bears no comparison to that of replacing broken glass insulators.

Mr. M. L. Woodford, of the Michigan Central Railroad, in reply to similar suggestions in reference to the Brooks Insulator in use on his through wire of three hundred miles, they having been in use three years, writes, Aug. 1st, as follows: "Our through wire works better in wet weather, this season than in dry. Am pleased to hear you have so many orders for insulators."

The Brooks Insulator.—Over three hundred telegraph operators, including superintendents, chief operators and experts connected with the telegraph lines in Pennsylvania, where the Brooks Insulators were first introduced, have signed and presented him a certificate stating their belief, based upon their own experience, that as much can be done in wet weather on one wire, insulated with the Brooks Insulator, as on four insulated with the common glass, and at less than one-fourth the expense.—*United States Railroad and Mining Journal.*

◆

THE ELECTRIC LIGHT.

The light produced from a powerful current of electricity, under favorable circumstances, is the most brilliant ever yet discovered by man. By actual experiment it has been shown to possess an intensity equal to one-third of that of sunlight. The light emanating from an incandescent piece of lime under the action of the oxy-hydrogen jet, well known as the Drummond light, cannot compare with it in brilliancy, nor compete with it in point of economy. Though the first cost in the preparation of an electric light may exceed that of the Drummond light, the subsequent outlay is much less.

The light is produced by passing an electrical current between two pieces of charcoal a small distance apart, one connected with the positive pole and the other with the negative pole of a galvanic battery. In order to keep these burning charcoal points always at such a distance from each other as to produce the most brilliant light, ingenious machines called "regulators" are used. The principle involved in the construction of these machines is, that the nearer the charcoal points are to each other, so much greater is the flow of electricity. Now, increase in the flow of electricity in the conducting wire will produce corresponding increase of magnetism in an iron bar which it encompasses; therefore, one of the charcoal points is inserted in an iron cylinder, which plays freely up and down in the centre of an electro-magnetic coil. As this coil exerts an attractive influence upon the iron, a weight passing over a pulley is attached to it, which, acting as a counterpoise, keeps it in equilibrium. The other point remains fixed. The result of this arrangement is that an increase of distance between the charcoal points gives a decrease in the flow, and consequently a decrease in the attractive power of the coil. The weight, for this reason, overbalances the attraction of the coil, and the charcoal point is drawn up until the increasing flow of electricity, caused by the decreasing distance between the charcoal points, shall have sufficiently augmented the attractive power of the coil as to restore the equilibrium.

The regulators employed in general use are much more complicated, but their principle is the same.

A machine has been invented in France by means of which this light may be derived from electro-magnetism. It consists of eight rows of powerful horseshoe magnets arranged around a hollow cylinder and having their poles towards the axis of the cylinder. The magnets are 7 in each row, 56 in all, and are attached to a stationary frame. The hollow cylinder has affixed a set of double coils or bobbins, 112 in all, so placed that, on revolving the cylinder, the ends of the bars, which are the cores of the bobbins, are in rapid succession brought in close proximity to the poles of the magnets, alternately approaching to and receding from them, with great rapidity. This causes a succession of almost instantaneous electrical impulses to be given to the wires coiled around the bars. Connecting this machine with the charcoal points, and revolving it at such a speed as to make the flow almost continuous, (for the light only shines while the current is passing,) a steady light will be produced.

It has been found, by experiment, that if a speed sufficient to give 200 electrical impulses per second be given to the machine, the eye no longer takes cognizance of the intervals, and an uninterrupted light is the result.

A curious example of the correlation of forces is shown in the working of this machine. The cylinder, which is hung in its bearings so delicately that it would seem possible for a child to revolve it with ease, really requires a two horse power engine, owing to certain effects produced by the action of the magnets in connection with the coils. This force expended is represented in the light produced; the machine converting force into electricity, and electricity into light; as in the case of the galvanic battery, the force resulting from the decomposition of zinc is the producer of the light.

The uses to which this light may be advantageously applied are numerous. Its peculiar penetrating power renders it unrivaled for light houses and signal lights for vessels. Let the darkness be so great that it "can be felt," its light pierces it like a great silvery needle, which, but for its warning, might have been the watching sailor's grave.

It has been used with success for illuminating mines. During the seige of Paris, the Prussians were much annoyed by one of these lights, which the Parisians had constructed and placed upon Fort Mont Valérien, and which effectively prevented any hostile movement being made by the Prussians under the cover of the night.

For stage effect, illuminating balls, streets, or other public places, and for microscopic or magic lantern exhibitions, it may be used.

The application of the electric system for illuminating Bergen Tunnel, through which the Erie Railroad and Delaware and Lackawanna Railroad traverse, we believe could easily be accomplished. Its adoption would relieve the thousands of passengers, which are carried through this tunnel daily, of the apprehension of accident which is irresistible to most persons as they enter the dark and cheerless cavern.

In fact, its uses are so numerous, and its effects so brilliant that it is a wonder that it has not been more universally adopted.

◆

LIGHTNING VERSUS GAS PIPES.

[*From a paper read to the Franklin Institute, by Professor J. Wise.*]

Last summer the steeple of the Congregational Church at Terre Haute, Ind. was struck by a bolt. From the description of it as given by an intelligent citizen of that place, the following facts are gathered: The bolt hurled the lightning rod into the street, then extending its force down and over the brick wall of the church, it seized upon the gas pipe in the wall, hurling the bricks outside at the point and the plastering inside; then passing down this pipe to the meter, it collapsed it and its lead connection pipes, and crumbled its dial plates; then it punched a hole an inch in diameter into the iron pipe that connects with the street main; passing along this connection to the street it ran along an iron main of an inch bore 650 feet, and along an iron main of four inches bore 250 feet, bursting the hubs of these mains along a distance of 1600 feet before its projectile energy was dissipated.

The lead packing of these pipes partially insulated the iron at each joint, in consequence of the lead being a poorer conductor than iron by 2¼ times, obstructing the moving force of the bolt, forcing the hubs of the pipes asunder for the distance above mentioned, causing a leakage of the gas and the discovery of the facts here detailed. Here, then, we find approximately the correlative amount of metal necessary to dissipate the energy of an ordinary bolt. Taking the outside of the pipes we shall have about 1,400 square feet of metal surface; include the inside, and we have 2,800 feet, and this would be equivalent to about 300 ordinary lightning rods.

Now if it took 1,000 feet of six and four inch bore of iron pipe laid in the moist earth to dissipate a thunderbolt, and only dissipated it after an extraordinary amount of energy was neutralized in the breaking of the iron hubs, how much of a similar bolt would be dissipated by five or six feet of a lightning rod of three quarters of an inch in diameter, projecting into the ground, which is the case with most rods? I will leave electricians to answer the question.

◆

A NEEDED IMPROVEMENT.—At last there is a prospect of the streets of the city being relieved of those ungainly, unsightly and dangerous masts which do duty as telegraph poles. While almost every other part of the paraphernalia connected with telegraphy has been improved upon, the poles alone remain as they were at the time of Professor Morse's first experiments. The Swedes and Prussians are ahead of the Americans in this regard, and have for some time past been using posts of galvanized iron. Following their example, Professor Prentiss has invented what might be called a telescopic telegraphic pole of galvanized iron. It is made in sections, which, for the purpose of ready transportation, fit one into the other, like a telescope or patent fishing rod. The largest section is but two and a half to three and a half inches in diameter, from which it may be judged that the pole will be slender and graceful, instead of being an eyesore. It is secured into the ground by means of spreading toes, fastened to a tablet at a short distance under the surface of the ground. The agent in this city is about perfecting arrangements with the Fire Department to erect the iron poles where a telegraph may be needed. It is claimed for iron poles that the first cost is but a trifle in excess of that of the wooden poles, that they favor a more perfect current of electricity, and do not need to be protected with lightning rods.—*N. Y. Herald.*

◆

SUPT. D. H. OGDEN, of Sioux City, Iowa, will soon be compelled, by the enlargement of his sphere of labor, to remove to Cedar Rapids, Iowa. He will then have the superintendence of an important range of lines, a trust to which he has proved himself entitled by former fidelity and ability. We regret to notice the death of his infant child.

NOTICE.

STUDENTS, if you wish to be placed in a position so as to acquire practically a thorough knowledge of Telegraphy, and receive commission while practicing, address, with stamp, UNION TELEGRAPH CO., Akron, Ohio.

Situation wanted by a lady Operator, who has experience, but is not a sound operator. Address

NELLIE G. NOIE,
Box 745, Danbury, Conn.

Journal of the Telegraph.

This Journal is issued on the 1st and 15th of each month. Its circulation is 6,500. It goes to every State, Territory, and Province on the continent. It is fast becoming a necessity, and is already welcomed as a friend. No better medium for advertising exists.

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JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, SEPTEMBER 1, 1871.

RAILROAD TELEGRAPHS.

As the traffic of the nation increases, and States distant from each other enlarge their population, the subject of railroad transportation to meet the growing demands of civilization becomes every year a problem of supreme significance, and challenges the utmost skill to solve. There would be little difficulty experienced in utilizing the present railroads for an immense traffic beyond the present were it not for the element of danger which constantly obtrudes itself. The railroads of the American continent as yet know little of the pressure put upon some European railways, and yet even here the utmost vigilance is necessary to secure against collisions and the blocking of roads on account of the various rates of speed assigned to its various trains, as well as the emergencies which are peculiar to the service, and which are always imminent.

In the vicinity of London, where some of the short suburban lines, corresponding somewhat to those of the first 30 miles of the Hudson, Harlem, New Haven, and Jersey Central, carry 400 to 600 trains a day, besides a hundred flitting out and in from and to the heart of the kingdom, it is evident that the highest order of scientific skill, as well as the utmost watchfulness, is demanded to make it passable. Coal trains, milk trains, vegetable trains, express, freight, lumber, way passenger and fast through trains, keep yelling their way out and in so as to require a management so vigilant and a care so sleepless as to tax the brain of the most eminently practical minds of the nation. Even in America the traffic is already so vast as to engross the highest representative talent of the country, and is demanding methods of operation which will secure quick and safe transit without the multiplication of tracks, and the vast expenditure which they involve. And in proportion as this demand appears and is pressed, so must the telegraph, because of its capacity to grant relief, assume a higher relative importance than it now occupies. It is becoming more evident that one hundred trains can traverse the same rails as easily as one, and with comparative safety, provided the guiding hand or eye can so watch and so guide the progress of each as to prevent interference.

This means of supervision the telegraph can largely, and can alone, provide, and so new methods of employing it are constantly being proposed. Some of these are frivolous and clumsy enough; others are suggestive of useful development into practicable forms. Its possibilities are immense. It is possible, for example, to make every train record its progress, so that the superintendent, in his office, can tell, as on a chess-board, where every one is snorting its way onward, its length, its speed, its obedience to rule. It can inform the engineer of open switches, and can be made to close them. It can grasp every wheel so sharply as to stop a lightning train in the very jaw of disaster. It is difficult to say where this grand agency is to end, or what accomplish. To railroads it is a solvent of a question of vast importance. It proves that, with its power of surveillance, a double-track road can do more than half a dozen tracks without it, and that a single track can have the value of two.

It is therefore without surprise that we see the railroad journals directing attention to the value of telegraphic signals and the supervisionary employment of the wires. There is much to be done in this direction. The direction of railroad wires will hereafter demand the finest practical talent, and the sternest character and discipline. The Booths, the Blisses, the Beaches are approaching a time when their duties will rival in importance the highest offices of the railway executive.

◆

Just as the wires are about to meet which are to connect Washington with the Halls of the Montezumas, we see a touch of civilization from the city of Mexico, in the form of a proposal that, cotemporaneous with the electric connection with the United States, Professor Morse be presented with Mexican citizenship. This may be called an empty honor to the man, but it is significant of the kindly instincts of neighborhood, and the pressure of civilization, which must soon lift a semi-barbarous people to national significance and ultimate dignity. What Napoleon and Maximilian failed to do, the silent operations of the wires, commerce, and proximity to an active, intelligent, free people, will soon accomplish.

◆

Perhaps it is not generally known that the idea is entertained by some scientists in England, that a naked iron wire laid between Europe and America, on the bed of the ocean, can be made to work with greater ease than the present insulated cables. Mr. C. F. Varley has recently read before the British Royal Society of London a paper to prove its impracticability, and arguing from data which he gives, that to work through such a line, with the speed now attained by the 2,500 miles of the French cable, the length must not exceed 1,100 yards, and that, generally, submerged bare wires cannot be practically operated on circuits exceeding one mile. It is true this statement is based on a conductor of the size of the French cable, and therefore small, but even with one much larger the argument would imply its futility.

It is very interesting to observe the argument itself, and how it is arrived at. The extreme subtlety of the experiments; the skillful guessing and refinement of the calculations; the shadowy bearing they have upon the result, all tend to astonish a tyro in such a field with the idea of the marvelous uses of the human reason. As an editor, we are supposed, of course, to know everything, but in the mist of these electrical refinements we are often compelled to lay down the record and exclaim, "It is high, I cannot attain unto it."

◆

It may be asked, in view of the disaster near Boston, which has so thrilled and saddened the whole nation, could not the use of the telegraph have prevented such a calamity? We believe it could. The stations were only a few miles apart. It seemed only necessary to order the express train to proceed on no section not signalled to be clear of other trains. To that simple use the telegraph should have been put. But madness ruled the hour. An express train hunting a way train before it around curves at full speed in the dark, is simply a record of insane presumption. No telegraphs could aid such an engineer.

◆

We can well afford to let our friends across the ocean rejoice over their government when we compare the results of their system with our own. Although Canada is comparatively poor, and the population sparse, yet we have relatively better accommodation and cheaper service than the wealthy and crowded centre of an Empire's commerce. There is not a village of five hundred inhabitants in Canada without a telegraph office, and, since the adoption of a universal twenty five cent tariff, messages can be sent for that amount nearly twice the distance of England's entire length. This is no small triumph for Canada, and we think the Montreal Company, which places such facilities at our command deserves well of the country. At the present time this Company works over 12,000 miles of wire, which, in proportion to population, is nearly double that of Great Britain. The number of offices open for business in this country bears a similar proportion. Last year the Montreal Company sent a million and a half of messages, which, relatively to population, is half as many again as the number transmitted in Britain. The security against mistakes appears also to be much greater in this country, the average of complaints not numbering one in six thousand messages, against one in six hundred in Britain. The admirable system carried out by Mr. Dwight and the other chief officers of the Montreal Company, is so well adapted to the wants of this country that, independently altogether of political considerations, there is no possible way in which the public would receive any increased benefit by having our telegraph absorbed by the government. The commission system enables the company to spread their lines through places that would not otherwise present a profitable source of investment, and thus we find them extending their lines to remote places, and bringing all parts of the Dominion into rapid and cheap communication. Taking everything into account, we have good reason to be pleased with our Canadian telegraphic system, and to claim for what we may call our great National Company, the universal support and encouragement of our people.—*Toronto Globe.*

ANSWERS TO CORRESPONDENTS.

Will you please give correct check, through your columns, to following message, and oblige:

Extra, one thirty-three, 133; No. one, one twenty-six and half, 126½; amber, one twenty-four and half, 124½. Corn, Oats, Barley, unchanged. Market active and firm.

Answer. 38 words.

Rule 6, as amended by Executive Order No. 107, is as follows:

"Where messages contain amounts, dates or numbers, require the customer, *in every instance*, to write them plainly in words. If such amounts, dates or numbers, after being plainly written in words, be also duplicated in figures *by the customer*, such figures must be counted as part of the message and included in the check. Figures inserted by the customer must not be erased by receivers or operators; nor will they insert them except at the request of the customer, in which case they will be charged for and transmitted. When amounts are duplicated in figures charge for the figures the same as for the words which represent them."

We do not see how plainer language can be employed to express the meaning intended than is used above. The customer is required to write, in words, all amounts, dates or numbers contained in the body of a message. If such amounts, dates or numbers are also duplicated in figures, such figures must be counted as part of the message and included in the check, the figures being charged for the same as for the words which represent them.

The customer is at liberty to write out the amounts, dates or numbers, in such words as he chooses, but whatever number of words he employs for this purpose must be charged for the figures which duplicate them. For example, if the message is written thus: One hundred and fifty (150), 8 words will be charged for; but if written thus: one hundred fifty (150), 6 words will be charged for.

Note.—In our issue of August 1 a different decision was given, and which was derived from the interpretation of a Receiver in the New York office, on which he had been acting. The above is authoritative.

◆

On the invitation of Captain Wm. Macintosh, the faithful and much worked foreman of the W. U. Telegraph Company, we took a trip on the new steamer *William Orton*, recently constructed for the purpose of laying cables in the neighborhood of New York. The day was very fine, and as we glided up the East River, on our way to the factory of our old and esteemed friend, S. C. Bishop, to receive a new cable for the North River crossing, the exquisite feeling of relief from desk duty made the sail exhilarating and delightful. The boat is made in the most substantial manner, her bulwarks protected by shining brass, her engines strong and perfect, which work not only the screw, but a cable drum forward of the pilot house, performing a service in shipping a cable which used to require a score of hands for four hours, but which is now done by three or four in one. The boat is under the control of an experienced pilot and engineer, and is a much needed appendage to the furniture of the Company, and will not only greatly facilitate and quicken its work, but greatly diminish the cost of this now very important part of its service. The *William Orton* is of light draft, steady in movement, and supplied with every convenience necessary for its peculiar work. While the weather is warm the invitation can be repeated without offence.

◆

A SINGULAR honor has been accorded to Prof. Morse in Paris. In changing the nomenclature of the streets so as to wipe out as much as possible every thing connected with past dynasties, one known as the Rue Blanqui is now called the Rue Morse, in honor of the Professor.

◆

ENGRAVING OF PROFESSOR MORSE.

Sent by mail, post paid, on receipt of 25 cents.

JAPAN.

The ends of the world have been reached. Telegraphic connection direct from London to Japan is announced. Cables between Trinidad and Demerara, and between Barbadoes and St. Vincent are being laid.

◆

GOLD AND STOCK TELEGRAPH CO.

The following notice has been issued by this Company:

NEW YORK, August 21st, 1871.

The Annual Meeting of the Stockholders of The Gold and Stock Telegraph Company, will be held at the office of the Company, Tuesday, September 5th, at 12 o'clock, for the election of Seven Directors and Three Inspectors of Election, and for such other business as may come before the meeting.

At this meeting the question of altering, amending, repealing or adding to the By-Laws of the Company will be submitted to the Stockholders, as provided by Article Thirteen of said By-Laws.

The Transfer Books will be closed from August 30th to September 5th, inclusive.

H. L. HOTCHKISS, Secretary.

This company has risen rapidly to importance. It furnishes 1,000 and more business houses in New York with cotton, produce, general commercial news, gold and stock quotations, and is rapidly extending itself through the country. It owns numerous valuable patents, and provides private telegraph lines and special reports for any point on the continent. Its business is already large and valuable.

A new cable has just been finished by Mr. Bishop, for this company's use. It is one of the best ever made, even by him. We have watched its mode of preparation and the care exercised upon it. It is for the North river, and will soon be laid.

◆

ANYTHING from Mr. Pope is valuable and practical. He advertises a learner's instrument which is cheap and can be used in actual service. This is a great advantage. The cut speaks for itself; likewise the advertisement. For short private lines it is another method, easy and cheap, for household use of the telegraph.

◆

STILL another. Mr. Burrell offers a printer for private lines. The peculiarities of this instrument we will refer to at another time. It is adapted to a single wire, and works easily and rapidly. By reading the advertisement "you can see how it is yourself."

◆

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
September 1, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since August 15, the date of the last tariff order.

Managers are hereby required to enter these changes in their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

* Ashuelot, N. H.
66 Audenried, Pa.
* Brasher Falls Village, N.Y.
66 Beaver Meadows, Pa.
156 Blackville, S. C.
346 Bryant, Iowa.
* Bloomingburg, N. Y.
* Bloomingdale, N. J.
201 Berlin, O.
* Bombay, N. Y.
* Centreville, Sullivan Co. N.Y
346 Charlotte, Iowa.
52 Coopersburg, Pa.
328 Collins, Ill.
52 Centre Valley, Pa.
66 Drifton, Pa.
367 Delmar, Iowa.
299 Dudley, Ill.
66 Ebervale, Pa.
66 Eckley, Pa.
* Edwards, N. Y.
* Fort Randall, Dac.
* Fallsburg, N. Y.
342 Forest, Miss.
427 Gallatin, Mo.
41 Hawthorne, N. J.
* Hermon, N. Y.
* Hogansburg, N. Y.
* Helena, N. Y.
66 Jeanville, Pa.
346 Lyons, Iowa.
367 Maquoketa, Iowa.
* Monticello, N. Y.
* Morley, N. Y.
66 Newport, Luzerne Co., Pa.
66 Nanticoke, Pa.
* Overlook Mtn. House, N. Y.
58 Pleasant Valley, Pa.
66 Parryville, Pa.
233 Plainville, O.
* Pine Hill Summit, N. Y.
* Pompton, N. J.
66 Stemton, Pa.
52 South Bethlehem, Pa.
18 Sharon, Mass.
66 Tresckow, Pa.
66 Upper Lehigh, Pa.
* Waddington, N. Y.
* Woodworth, N. Y.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.	*Leaves this Line.*
Ashuelot, N. H.,	25 2 35 2	Keene, N. H. Nashua, N. H.
Brasher Falls Village, N. Y.,	Same as Stockholm.	Same as Stockholm, N. Y.
Bloomingburg, N. Y.,	25 2	Middletown, N. Y.
Bloomingdale, N. J.,	20 2	Hawthorne, N. J.
Bombay, N. Y.,	Same as Brushes Mills,	Same as Brushes Mills, N. J.
Centreville, Sullivan Co., N. Y.,	25 2	Middletown, N. Y.
Edwards, N. Y.,	Same as Gouverneur,	Same as Gouverneur, N. Y
Fort Randall, Dac.,	200 13	Sioux City, Iowa
Fallsburg, N. Y.,	30 2	Middletown, N. Y.
Helena, N. Y.,	Same as Lawrence,	Same as Lawrence, N. Y.
Hogansburg, N. Y.,	Same as Massena,	Same as Massena, N. Y.
Hermon, N. Y.,	Same as DeKalb Junc.	Same as DeKalb Junc., N. Y.
Monticello, N. Y.,	30 2	Middletown, N. Y.
Morley, N. Y.,	Same as Canton,	Same as Canton, N. Y.
Overlook Mtn. House, N. Y.,	30 3	Rondout, N. Y.
Pine Hill Summit, N. Y.,	40 3	"
Pompton, N. J.,	20 2	Hawthorne, N. J.
Woodstock, N. Y.,	30 3	Rondout, N. Y.
Waddington, N. Y.,	Same as Ogdensburg,	Same as Ogdensburg, N. Y.
Barachois, Que.,	30 2	Send and check via most direct route.
Bonaventure, Que.,		
Cape Cove, Que.,		
Carleton, Que.,		
Cape Rosier, Que.,		
Churches Falls, Ont.,		
Douglastown, Que.,		
Erin, Ont.,		
Fox River, Que.,		
Grand River, Que.,		
Grand Greve, Que.,		
Hillsburg, Ont.,		
Kars, Ont.,		
Matane, Que.,		
Mission Point, Que.,		
Maria, Que.,		
Newport, Que.,		
New Richmond, Que.,		
New Carlisle, Que.,		
North Gower, Ont.,		
Paspebiac, Que.,		
Port Daniel, Que.,		
Perce, Que.,		
Point St. Peter, Que.,		
Pabos, Que.,		
Port David, Que.,		

OFFICES CLOSED.

Armstrong Run, Pa.; Cleveland, Ill.; Kingston, Md.; Port Treverton, Pa.; Princess Anne, Md.

GENERAL INFORMATION.

The P. O. address of Stemton, is Allentown P. O.; Newport, Luzerne Co., Wilkesbarre P. O.; Drifton and Ebervale, Jeddo P. O. All in Penn.

The following changes in "Tariff for other Lines" have been authorized:

West Hurley, N. Y., 25 and 2; Brodheads and Shokan, N. Y., 30 and 2; and Mt. Pleasant, N. Y., 25 and 2. From Rondout, N. Y.

"Half-rate" messages will hereafter be taken for and received from McConnellsville, O.; Frankford, Pa.; Germantown, Pa.; Manayunk, Pa.; Port Richmond, Phila., Pa.; West Phila, Pa.

The office heretofore known as Brasher Falls, N. Y., has been changed to Stockholm Depot, N. Y.

Tariff to Russell, N. Y., other line ofs., is same as DeKalb Junc., N. Y.

Business for Jeddo, Pa., will hereafter be checked direct.

Foxboro, Mass., will hereafter be in square 18, and French Village, Ill., in square 348.

Newport, Pa., square 94, is in Perry Co.

Offices having "Special Sheet A" will check Coopersburg, Centre Valley, Ebervale Jeanville, Tresckow, Audenried, Beaver Meadows, Nanticoke, Newport, Luzerne County, Upper Lehigh and Eckley, Pa., 25 cents; Stemton, Parryville, Pleasant Valley and Drifton, Pa., 25 cents more than "special rate" to Philadelphia, Pa.

Salina, N. Y., same as "special rate" to Syracuse, N. Y., and So. Bethlehem, Pa., same as "special rate" to Bethlehem, Pa.

ATLANTIC CABLE BUSINESS.

Direct communication is now open to Japan.

The rate from London to Nagasaki is $46.25 for 20 words, and half the above rate for each additional 10 words or fraction thereof.

WILLIAM ORTON, *President.*

FLASHES OF LIGHT.

HOW THE VELOCITY OF THE ELECTRICAL SPARK IS MEASURED.

To the Editors of the Evening Post

The results of the admirable research of Professor Rood on the deviation of the electric spark, given in the *Evening Post*, have so interested and surprised all who have read them, that we propose giving a popular account of the ingenious yet very simple methods by which men of science have succeeded in measuring extremely minute portions of time.

A wheel painted black and carrying a distinct white point on its circumference is provided with some means of giving it a uniform motion of rotation. If the wheel make one revolution in one-sixth of a second, the white point will appear as a continuous circle; for any impression produced on the eye remains during one-sixth of a second, therefore during one revolution of the wheel all the successive positions on the circumference occupied by the bright point remain impressed on the eye, and hence the circle appears unbroken. Now, if a flash of light in the place of the white point should last one-sixth of a second, the circle would appear complete; but if it lasted one-twelfth or one-twenty-fourth of a second then would the point describe one-half or one quarter of the whole circle. Thus, by this simple means—remembering that the smaller the arc of the circle the less the duration of the flash—we can readily measure, from the length of this arc, quite minute portions of time.

If, instead of having one white point on the wheel, we have one hundred or more radial white bands drawn with the space between them equal to their breadth; then, if the wheel makes ten turns in a second, any radial white band will advance into the position previously occupied by an adjoining black band in one-thousandth of a second, and if the flash of light lasted one thousandth of a second all the white bands would, during that interval, have advanced into the position of the black bands, and *vice versa*, and the disc would appear without bands and covered with a uniform gray tint. We can thus readily and accurately measure one-thousandth of a second.

With the above apparatus Arago, about the year 1835, first showed that a flash of lightning lasted less that one-thousandth of a second, but did not succeed in fixing the minimum limit to its duration. Professor Rood, however was more fortunate; for during the well remembered remarkable display of lightning in August, 1869, with an apparatus similar to the above (extemporized from a piece of pasteboard and a shawl pin), he succeeded in measuring one five-hundredth of a second as the duration of those vivid and extensive flashes.

It was soon found that the velocity of the revolving disc fell far behind that of the spark of the Leyden jar, for its flash showed the revolving radial bars as absolutely at rest as when the disc was stationary. But Professor Wheatstone, of London, in 1834 substituted for the revolving disc a mirror turning on a horizontal axis, and instead of the white point or bars, he used the image of the spark reflected from the turning mirror. If the spark be instantaneous, then will it appear in the rotating mirror just as it is seen when reflected from the mirror at rest; but, if the spark last during even an extremely minute fraction of a second, it will appear drawn into a line in the direction in which the mirror turns. Wheatstone thus measured the one million-one-hundred-and-fifty-thousandth of a second, and ascertained that the electricity from a Leyden jar goes over a copper wire at the rate of 288,000 miles in a second, exceeding light itself in velocity.

Professor Rood combined the two methods above given by viewing the appearance of stationary parallel and equi-distant white and black bands reflected from the revolving mirror while the flash of the Leyden jar illuminated them. The direction of rotation of the mirror being across the length of the bands (which were only sixteen-thousandths of an inch apart), if the flash lasted during the time for the turning mirror to reflect a black band into the adjacent white space, then the bands would entirely disappear, and the plate on which they were drawn would appear of a uniform gray tint. By knowing the number of turns the mirror makes in a second, and the number of bands in the space of one inch, it is easy to calculate the time necessary for the obliteration of the bands. Thus has he produced, by this simple combination, an instrument surpassing in minuteness and accuracy of determination all that has gone before; an accomplishment which cannot but reflect much renown upon American science. He has succeeded (with a mirror making three hundred and fifty turns in a second) in measuring accurately forty billionths of a second, and has shown that this is the duration of the flash of a Leyden jar having only eleven square inches of surface and one-twenty-fifth of an inch striking distance—an interval of time just sufficient for a ray of light going at the rate of one hundred and ninety thousand miles in a second—to travel over forty feet. The flash from a jar having one hundred and fourteen square inches of surface lasted four times as long as the smaller jar. Thus, for the range of electric flashes we have measures from the one-five-hundredth to the forty-billionth of a second.

Astonishing as is the fact of the concentration of the power of a lightning-flash into such a minute interval, yet, as wonderful is the extent of the earth's surface affected by it, as will be seen from the following experiments of the writer, never before published: A galvanometer consists of a delicately-suspended magnetic needle surrounded by a coil of copper wire, through which a current of electricity can pass: whenever this passage takes place the needle rapidly turns around its point of suspension. This being understood, I connected the wire of a galvanometer with the water-pipes of Baltimore, and the other end of the coil was joined to a gas-pipe of a house in the southwest part of the city. Thus a vast metallic system of electric nerves stretched away three miles to the northwest, to the reservoir, and about as many to the east and southeast over the city. A thunder-storm was raging at the time, at so great a distance in the north that only the illumination of the clouds told when a flash occurred. Yet, whenever that flash took place, the needle was instantly deflected through ten or twenty degrees. The two occurrences were simultaneous, apparently, for I could detect no difference in the instant of their manifestation. Indeed, so sure an indicator of the flash was the galvanometer, that when I shut myself up in a dark room, signaling to an observer of the storm whenever the needle moved, and receiving a signal from him when a flash occurred, our signals were always simultaneous. The next day it was ascertained that the storm was over twelve miles distant; therefore at least five hundred square miles of the earth's surface were affected (inductively) at each flash of the lightning. A. M. M.

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ONE of the many singular facts that are brought to light by the telegraph is, that certain types of minds instinctively connect haste with danger or disaster. It was not many years ago that it was considered dangerous to travel from York to London under two days. The telegraph, then, which is a very hurrying sort of affair, would, we can easily imagine, create a certain amount of alarm from its speed alone; but, in addition to this, it was, when first used, a very expensive way of sending intelligence, and employed therefore only in extreme cases. Hence the public, to a certain extent, have been trained to connect a telegraphic message with sudden illness, accidents, want of a doctor, fires, or some disaster; and, to those whose lives jog on in a slow, every day style, a telegraphic message is so unusual an event, that they are probably correct when they connect a telegraphic message with alarming news. Though the establishment of a London district telegraph has to some extent done away with these ideas, there yet lingers a large remnant of this alarm, which crops out on many occasions.

Not long since, the District Telegraph Company considered it advisable to send out a few circulars informing the public that they could now procure one hundred of their stamps for one pound; that a stamp placed on a written message, which might be enclosed in an envelope and sent to the nearest station, would ensure the transmission of their message: thus, that the actual price of a message of fifteen words is rather under twopence halfpenny. This information was received by many people with pleasure, as they found they could now send their messages at a very economical rate, but others did not accept the information with the same feelings. One gentleman, upon the receipt of the circular, immediately communicated to the company, and remonstrated with them. It appeared that he had a near relation seriously ill, about whom he was very anxious. Upon the receipt of the circular, on the envelope of which was printed "Telegraph Company," he was greatly alarmed; so much so, in fact, that he had not been well for several days afterwards, as he of course imagined that this friend must be dead, in consequence of his receiving something from a telegraph office.

WANTED.

A good, sound Operator who, in addition to his telegraph duties, will be required to take charge of a full set of double entry books. First-class references required. Address box 1,041, New York Post Office.

MARRIED.

LA GORCE—O'BRIEN.—At the Cathedral, Pittsburgh, Pa., Sept. 26, by Rt. Rev. Bishop Dominic, G. H. La Gorce, Superintendent Wheatland Furnaces, Pa., to Miss Lizzie C. O'Brien, Manager Western Union Telegraph Office, Easton, Pa.

BALL—DELANY.—At the residence of the bride's parents, by Rev. Dr. Wigger, Abram Ball, Conductor D. L. & W. R. R. Co., of Morristown, N. J., to Annie M. DeLany, daughter of Wm. DeLany, Esq., of Summit, N. J.

WEITER—DELANY.—At the same time and place, by the Rev. Dr. Wigger, T. Stewart Weiter, Manager W. U. Telegraph Office, and Agent D. L. & W. R. R. Co. at Summit, N. J., (formerly of Hackettstown, N. J.) to Carrie O. DeLany, youngest daughter of Wm. DeLany, Esq., of N. J.

To the parties on this double wedding we extend our kindest congratulations. To the father, who thus loses from his home two loving daughters, we extend our sympathy. We know how it is ourself.

DIED.

MILLER.—At Shreve, O., Sept. 10, Julania, wife of Ed. O. Miller, operator, Shreve, O., aged 20 years 9 months and 25 days.

CRAIG.—At Centreville, Crawford Co., Pa., Tuesday morning, Sept. 19, Frank Willis, oldest son of John L. and Kate A. Craig, aged 1 year 10 months and 13 days.

"The Lord gave. The Lord hath taken away. Blessed be the name of the Lord."

NICE.—At B. C. Junction, Pa., Sept. 4, Sarah, daughter of Chas and Alice Nice, aged 2 months.

BORN.

To David Blackham, operator, 145 Broadway, Sept. 5, a daughter. Weight ten pounds.

Sept. 8, unto T. V. Finney, manager W. U. office at Arenzville, Ill., a daughter. Weight nine pounds.

A SUPERIOR

Printing Telegraph Instrument,

FOR PRIVATE AND SHORT LINES.

The undersigned is now prepared to supply the improved and superior

PRINTING TELEGRAPH INSTRUMENTS

manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES,

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employees, &c., for the introduction of the Printer.

For further particulars, terms, &c., apply to

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For Strength, Beauty of Finish, Lustre of Reflector, and power to throw light a great distance, the Lamps of our manufacture stand unrivaled. Testimonials from prominent Railroad Officers all unite in pronouncing our Patent Head Lamp

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Best Conductor Lamp, with reflector (Nickel, Plated)	$20 00
Best Conductor Lamp, German Silver, with Reflector	10 00
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Best Conductor Lamp, of German Silver, without Reflector,	8 00
Best Conductor Lamp, of Brass, without Reflector	6 00
No. 3 Planished Tin and Brass Lamp, Flange Top	5 00
No. 3 Egg, Fancy, Pennsylvania R. R. Style	3 00
No. 4 American Merchants' Union Express Co. Style	3 00
No. 4 Flange Top, New York Central R. R. Style	2 50

ENGRAVING NAMES AND WREATHES INCLUDED IN THE ABOVE PRICES.

Boxes for Single Lamps, 25 cts. each. Money to be returned free.

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Firemen's Trumpets of all Styles and Sizes, Made to Order.

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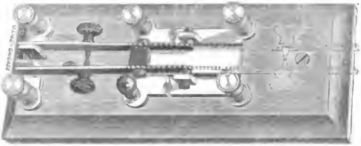
SYRINGES, FUNNELS, HYDROMETERS,
ACIDS AND CHEMICALS FOR BATTERIES,

KERITE WIRE,
BRAIDED AND WOUND OFFICE WIRE,
GUTTA PERCHA OFFICE WIRE,
SWITCH CORD,
CALLAUD BATTERY,
DANIELL BATTERY,
GROVE BATTERY,
BUNSEN BATTERY,
LECLANCHE BATTERY,
HILL BATTERY.



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Marshall Lefferts, James H. Banker, Alonzo B. Cornell,
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This Company furnish

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COTTON AND PRODUCE EXCHANGE, and
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to its subscribers, by

TELEGRAPHIC PRINTING INSTRUMENTS,

at their respective places of business; and also erect and maintain

PRIVATE TELEGRAPH LINES

for Corporations and Individuals, operated with

PRINTING INSTRUMENTS.

As manufacturers of all the *perfect* Telegraphic Printing Instruments in use, and owners of a large number of Patents, we are prepared, under the facilities of our contracts with the Western Union Telegraph Co., to extend our system of Commercial Reports and Private Lines to all parts of the United States.

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NEW YORK.

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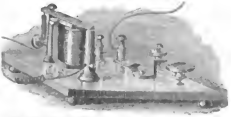
Norman C. Miller, Treas. Horace L. Hotchkiss, Sec'y
Edward A. Calahan, Sup't.

THE NONPAREIL TELEGRAPH APPARATUS.

(Patent applied for.)



This apparatus supplies a want which has long been felt, viz: that of a SIMPLE and CHEAP

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with all the necessary Batteries and other appurtenances in a CONVENIENT and COMPACT form. It is intended especially for the use of

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PRICES:

Single Instrument, complete, with Batteries, etc	$8 00
Double " " " " "	15 00

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With Instructions for putting up and operating.

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MECHANICAL TELEGRAPH INSTRUMENT,

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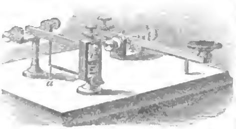

For Students, Colleges, &c. No battery required. An ordinary key and sounder is placed upon a proper base. The sounder is moved by a lever under the base, connected with the key, making a perfect instrument for those wishing to learn the Art of Telegraphy. An expert could not tell, without examining it, that the instrument was not worked by a battery.

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We will send a copy of SMITH'S MANUAL, free of charge, with each instrument, to individuals or clubs. The instructions in this Manual are particularly adapted to those who wish to learn by sound.

Special and liberal terms to manufacturers.

Remittances can be made by certified draft on New York, Cleveland, or Pittsburgh, money by express, charges paid, post office order, or registered letter at our risk.

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Price, $7. Silver Plated, Extra Finish. $10.

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For the accommodation of the

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we shall hereafter keep a stock of the Celebrated

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PRICES AS FOLLOWS:

No. 9, Plain Annealed	4½	cts. Gold.
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This Brand of Wire is the best in the world, and has been adopted exclusively by the Western Union and many other Telegraph Companies.

We also continue to import this Wire for use in this country, notwithstanding the high rate of duty imposed by Congress in the interest of the monopolists. Any amount of it can be seen at our store at all times. The import duty on wire is now two cents per lb. gold, and 15 per cent. *ad valorem*.

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Offer the best guaranty of excellence in their profession—in their long established business—in the extent and variety of their manufacturing facilities—in the many improvements introduced by them, now almost universally adopted or imitated—and in the extent of their business, domestic and foreign, enabling them to keep pace with telegraphic progress.

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JOURNAL OF THE TELEGRAPH.

VOL. IV. NO. 22. NEW YORK, OCTOBER 16, 1871. WHOLE NO. 95.

SIR WILLIAM THOMSON, F. R. S., D. C. L.

At the meeting of the British Association held in the Scottish Capital, Sir William Thompson succeeds Professor Huxley in the office of president. Sir William Thompson takes rank as one of our greatest living mathematicians and natural philosophers. For his eminent scientific services in the improvement of submarine telegraphy, and in connection with the laying of the Atlantic telegraph cable, he received in 1866 the honor of knighthood. Sir William was born at Belfast in 1824. His father, Dr. James Thompson, was at that time one of the professors of the Belfast College, but was in 1832 transferred to the Chair of Mathematics in the University of Glasgow, where he attained to a high reputation as an enthusiastic and successful teacher, and became also known as the author of an "Elementary Treatise on Algebra, Theoretical and Practical." When an undergraduate at Cambridge, Mr. Thompson gave proof of his talent for the mathematical treatment of problems in natural philosophy by the publication of several remarkable papers in the *Cambridge Mathematical Journal*. An article on the "Motion of Heat" was contributed by him in 1842, the author being then in his eighteenth year.

In 1846, at the age of twenty-two, Mr. Thompson succeeded Dr. W. Meiklcham as Professor of Natural Philosophy in the University of Glasgow. In the following year he became a Fellow of the Royal Society of Edinburgh, and soon afterwards also a Fellow of the Royal Society of London. To the former learned society he has communicated an extended series of valuable papers on the dynamical theory of heat, and also original speculations on the cognate subject of solar heat. To the latter he has chiefly communicated his researches on electricity. A gold medal of the Royal Society was presented at the anniversary meeting in 1856, for "his various physical researches relating to electricity, to the motive power of heat, and to other subjects."

The researches of Professor Thompson in electricity, begun at Cambridge, have been continued through a long series of years. Up to the year 1860, he has made to the British Association nearly thirty different communications on one branch or other of this department of science. His method of electrical images was first made known to the public at the meeting of the British Association, held at Oxford, in 1847; and is further expounded in the *Cambridge and Dublin Mathematical Journal*, for 1850. To the Royal Society he communicated an account of "Researches in Thermo-Electricity," in May, 1854. And in the following year he made a contribution to the same body, "On the Theory of the Electric Telegraph." The investigations recorded in that paper it appears were commenced in consequence of a letter received by the author from Professor Stokes, dated 16th October, 1854, and were communicated to the society before the development of the mathematical papers was completed, as serving to indicate some important applications of the theory. The inquiry into which Professor Thomson was led by the letter of Professor Stokes was, it would appear, the point of transition from his more abstract researches in electricity to their practical applications in land and submarine telegraphy, by which he was afterwards to render signal service to the world, and to become more widely and popularly known.

The month of August, 1858, will ever be memorable in history. In that month the world's news was for the first time read on the same day in the capitals of Europe and America. As the time for laying down the cable of 1858 approached, difficulties of a formidable character were experienced in the electrical department; and Professor Thompson consented to go out in the "Agamemon," and occupy the place of acting electrician. After the cable was laid, he remained at Valentia, and perfected that wonderful instrument known as Thomson's galvanometer, which combines extreme delicacy and simplicity of construction, with a large visible range of observation presented to the eye. By this instrument a ray of light reflected from a tiny mirror suspended to a magnet, travels along a scale and indicates the resistance to the passage of the electric current through the cable by the deflection of the magnet, which is marked by the course of this spark of light. If the light of the mirror travels beyond the index or out of bounds an escape of the current is taking place. From the failure of the cable to communicate in October, 1858, until the great enterprise was finally achieved, Professor Thomson was actively engaged with the subject of deep-sea telegraphy; and both by advice and action has exerted himself to the utmost to perfect the system of telegraphic communication. He accompanied the subsequent expeditions of 1865 and of 1866, and shared, as he had a right to do, in the honors conferred on those whose skill had accomplished the great undertaking.

A more recent invention, the syphon-recording instrument,[*] was exhibited for the first time in England at the opening of the British Indian Submarine Telegraph, when the prince of Wales was present. In virtue of improvements recently made, this instrument is now beginning to supersede the "mirror telegraphic galvanometer.—*The Leisure Hour*.

NEW FORMS OF GALVANIC BATTERIES.

From the London Chemical News.

Sir: I send you a brief account of the results of my experiments on galvanic batteries. I tried some thousands of experiments, and kept batteries at work, watching them night and day for several months.

I soon found that the great point to secure constancy was a good negative. The positive is of minor importance, as the oxidation or other similar chemical change which takes place there produces a change of specific gravity in the liquid, securing a circulation and consequently a continuation of the action. This is much assisted by the action of heat, which itself, if applied at the bottom of the vessel, produces a circulation, and at the same time increases the conductibility of the fluid.

But the substances conveyed to the negative ordinarily cling there, and both by their chemical reaction and by forming a film on the surface soon immensely reduce the potential. This difficulty has been overcome in several ways, which I will proceed to discuss:

(1.) By a solution of copper, which absorbs hydrogen and produces metallic copper. Hitherto, this, on the whole, has been found the most convenient method for ordinary purposes, as in the Daniell battery. But to this there are many objections:

1. Copper is not a very powerful negative, and to get a good potential requires an expensive positive, such as zinc, magnesium, &c., in order to secure much power. Copper and iron, for instance, are so near in their potential as not to give more than half the potential of copper and zinc, and consequently, when the expense of the negative is taken into consideration, the use of iron effects but little economy.

2. There is so much water of crystallization in sulphate of copper that it requires very nearly four pounds to sulphoxydize one pound of zinc.

3. Sulphate of copper is not only rather insoluble, but is a nasty creeping salt, which is sure to find its way wherever you want to keep it out, and by getting to the zinc sets up a local action, wasteful and injurious. Every one who has used a Daniell battery for long knows how troublesome it is to keep in order.

The last difficulty may be obviated by using a neutral salt and silicate of soda with the zinc. The silicate precipitates the salts both of copper and zinc as silicates, and adds much to the steadiness and efficiency of the battery. With a mixture of nitrate and silicate of soda, magnesium may be used as a very powerful positive, and without any local action, which usually destroys it almost immediately. It is an expensive but most convenient and powerful positive.

(2.) By nitric acid with the negative to oxydize the hydrogen. This is very good for a short time, but the acid losing part of its oxygen soon becomes gaseous and fumes, both weakening the potential and proving very injurious to the health and comfort of any one subject to its influence.

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[*] This remarkable instrument writes down in ordinary ink every fluctuation of the electric current received at the end of a submarine cable, and is likely to replace everywhere the mirror galvanometer, by which hitherto all messages through long cables have been received. The older instrument shows every change by the waving backward and forward of a little spot of light, leaving no trace of its wayward motions. The new instrument receives and indicates everything already indicated by Sir William's earlier invention, and writes indelibly. This is accomplished without any sacrifice in the sensitiveness of the instrument. A very fine glass syphon waves to and fro over a running strip of paper without touching it, and from this syphon ink is sparted on to the paper by a series of electric sparks, these sparks being generated by a peculiar induction machine. This fine rain leaves a trace of the position of the syphon at every instant, in a fine continuous line. The syphon follows faithfully the rise and fall of the received current, and these alternations are arranged so as to form an alphabet, as in the usual single-needle instruments. The rain of ink opposes not the slightest resistance to the free motion of the syphon.

(3.) Chromic acid. This, as chromic acid, though an excellent negative, is very expensive, being sold, ordinarily, at one shilling an ounce. Chromate of potassium, which is commonly used with sulphuric acid, is both expensive (being now, I believe, £90 per ton, wholesale) and very insoluble. Bichromate of soda is both much better and much cheaper (about £45 a ton now), but is difficult to procure, being sold only in lots of four tons. The potential of chromic acid is great—considerably greater than nitric acid—but soon becomes weaker, as it passes through the stages of chromoso-chromic, chromous oxyd, &c.; mixed with nitric acid, it helps to stop the fumes, as chromous acid absorbs nitric oxyd gas.

(4.) As far as I know, I have been the first to use the permanganates with acid; they are very powerful—more so than even chromic acid—but require adding gradually in order to supply oxygen, otherwise the oxygen flies off and the effect is lost. The action is so powerful that I have seen the wet coke electrode actually burst out into a flame on the first application of a permanganate with sulphuric acid. The permanganate of soda may be had at about £40 a ton, and, therefore, is not a very expensive source of oxygen.

(5.) As far as I know, too, I have been the first to use the chlorates, or chloride of lime (so called) with an acid; they are powerful negatives, but not so powerful as chromic or permanganic acid, and the evolution of chlorine in a gaseous form is objectionable.

(6.) Sulphate of mercury is expensive and very slowly soluble. Marie Davy introduced it in France, but I hear it is now abandoned for sulphate of copper.

(7.) Peroxide of magnesia. In some cases this is useful where a battery is very little used; but without acid it parts with its oxygen very slowly, and the Leclanché battery in which it is used very soon exhausts itself when put to do any hard work. At the Post Office, after an hour's work, it has to be removed and a fresh one substituted till it has recovered itself.

(8.) My experiments at last led me to the conclusion that by far the best and cheapest negative is the air itself, which, of course, is practically used always in oxydizing coal for producing power. For this purpose I pack the negative, carbon or platinum, in a high porous cell with cinders, or similar material, broken so as to be freely pervious to the atmosphere, and forming a damp porous bed, on the surface and pores and cavities of which the deoxydized materials may recover their oxygen. Thus the nitric oxyd fumes are oxydized and flow back as nitroso-nitric acid; hydrogen is oxydized into water, especially if a little platinum black be sifted on the surface of the cinders and made to cling to it by dipping the cinders in a little soap and water. A battery thus, if not overworked, becomes perfectly constant. If very hard work be required, the dimensions of the porous jar must be enlarged, and holes pierced above the level of the liquid to secure a good draught of air through the coke. The porous cell should of course only partially be filled with the liquid. I find the best plan is to put the zinc or iron in a neutral solution, which prevents the necessity of amalgamation, and to place in the porous cell with the carbon sulphuric and nitric acid in proportions proper for sulphoxydizing the zinc. If sulphur be put in the cell with the zinc or iron, the oxydizing of the sulphur will furnish the sulphuric acid, and save the necessity of sulphuric acid in the negative cell. With this negative iron may be advantageously used as a positive, as the potential of iron with a powerful negative is about ⅔ of zinc, thus effecting a very considerable saving.

A very convenient battery is formed by using a solution of sulphate or muriate of ammonia for both parts of the cell. The acid unites with the zinc, and the ammonia and the hydrogen are oxydized on the coke, or partly oxydized, so as to form a solution of nitrate of ammonia, which itself acts over again.

Having obtained this excellent negative, I amused myself with trying almost every conceivable oxydizable substance as a positive. Of course a metal is quite unnecessary, any oxydizable liquid with carbon to collect the electricity being as effectual as a metal. Sulphur, a mixture of sulphur and carbonaceous matter (as in gun powder), sugar, sawdust (especially with peroxyd of magnesia and sulphuric acid to decompose it), brandy and water, gruel, tea, broth, all gave good currents; the positive part of the cell acting the part of the stomach in the human body, and the porous cell with its cinders playing the part of the lungs. Again, all solutions of salts only partially oxydized, such as the hyposulphites, the cyanides, the sulphates, ferrous salts, gave exceedingly good currents, many of them fully as strong as a Daniell battery. The most powerful are of course the soluble sulphides, which in their first stages of oxydation are 60 to 70 per cent stronger than a Daniell, getting weaker as they go through the process of becoming sulphites and thionates. But as a hyposulphite is more valuable than a sulphide, the product after the first stage of oxydation is more valuable than the substance used, so that the electricity is got for less than nothing. Waste sulphide of calcium may thus become an important source of electrical and mechanical power. Heat, as it greatly increases the affinity of sulphur for oxygen, very much assists the action of these batteries. Again, ferrous sulphate gives an excellent current, and if we keep it in the condition of a ferrous salt by placing in it a sulphide of iron, forms a very cheap, indeed costless, source of electricity, because sulphate of iron is more valuable than a sulphide.

I will only add that I found that any common battery as the Wollaston, the Smee, and teh Walker, if placed over a source of heat, so as to evolve steam from the negative, is made very powerful, and perfectly constant; the steam sweeping away the hydrogen from its surface. The common Walker battery is thus made equal to a Grove, and a Wollaston to a Daniell.

Now this production of cheap electricity opens a wide field for the substitution of magnetism for steam power. Even if Joule's theory were true, magnetic power could be produced as cheap as steam power. But I repeat, what I have written and explained privately to Dr. Joule, that his original experiments in 1843, when carefully and minutely examined, overthrow his own theory. Men like Sir W. Thomson and Tait doubtless do not like to be told that their elaborate science, built up mathematically with so much care and trouble, is based on a quicksand, and is inconsistent with facts. You know yourself how much odium and what violent attacks you have incurred by inserting my articles, which, though no doubt they contain mistakes, are in the main true. The British Association absolutely refused to hear me, or even to admit a description of my batteries, lest, I presume, heresy should lurk even in them; but I noticed notwithstanding a considerable change in the tone in which both Sir W. Thomson and Tait spoke on the subject; though the latter took for granted the absurd supposition that—272° is the absolute zero of temperature, which idea I find good judges consider I conclusively disproved in an article some months since in the *Chemical News*; and where is the report of the committee appointed to determine the mechanical equivalent of heat? £50 was paid to them in 1870 for their expenses. What have they found to be the mechanical equivalent? They maintain a judicious silence themselves, though they are determined, as far as in them lies, to silence me too.

I urged a friend of mine, Mr. Slater, the optician, of 136 Euston Road, who has the apparatus required and well-constructed magnets, to try how much power he could get by electricity. He writes to me to say that, by accurate measurements and weighings, he has got 300 foot-pounds out of a grain of iron, and he is persuaded that by improved mechanism he could get at least six times as much. Now, even 300 foot-pounds to a grain of iron is only nine pounds of iron per day of ten hours for a horse-power, a cost which may vie with steam in economy. And taking sulphide of calcium or of iron instead of iron, we can reduce the cost per horse-power to a mere trifle. The only question is the cost and convenience of the machinery. Even if the American statements are an exaggeration, this question must soon be the question of the day for all machinists and engineers.

I am, &c., H. HIGHTON.

2, The Cedars, Putney, Sept. 18, 1871.

P. S. Since writing my letter, my ingenious friend Mr. Slater, by a larger battery, has obtained 1,199,700 foot-pounds of work from 7 ounces of iron, or 388 per grain; this with two electro-magnets rotating before a fixed electro-magnet. H. H.

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WHAT THE TELEGRAPH DID.—During the convention just held in this city there were sent over the wires of the Western Union telegraph office 60,000 words of special reports for the press. This is of course exclusive of the large business done in private dispatches. And yet so complete were the arrangements which manager Pike and Superintendent Gifford had made, that at no time was "copy" allowed to accumulate on the hands of the operator. Captain Howell and Mr. Rooker, of the Associated Press, declared that their reports had never before been transmitted with such promptness. That's the advantage in holding a convention in a live city with a live telegraph office.—*Syracuse Courier.*

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SCIENTIFIC men suspect the existence of a connection between the working of electro-magnetic forces on the earth and the spots on the sun. The supposition is upheld by a chain of circumstantial evidence of considerable strength. There seems to be recurring periods in which the spots are extraordinarily numerous. There seem to be recurring periods in which the magnetic forces of the earth are extraordinarily active and auroras are remarkably abundant and brilliant. The two periods correspond in terms of from ten to eleven years each. The sun spots of 1869 were never exceeded for number, and there were auroras nearly all the time. In 1859 there were likewise many sun-spots and many auroras. On the 1st of September of that year, two English astronomers looking at the sun observed great and sudden commotions among the spots and intensely bright patches of light flashing in the midst of them. At the same instant a tremenduous magnetic storm began all over the earth. It was marked by the interruption of telegraphic lines and by other signs, in England, in Norway, in Australia, in the United States, in the West Indies, in South America. At night, every part of the world where the aurora is ever seen was illuminated by it in the most magnificent style.

ON A NEW SOURCE OF ELECTRICITY.

BY JAMES ST. CLAIR GRAY, M.B., C.M.

In the course of some experiments relative to sulphur and phosphorus, my attention was drawn to their mutual action while in alkaline solutions, and it occurred to me that probably from this there might be derived an electric current.

In order to ascertain this, as well as to determine—should there prove to be such—whether it was constant or not, there was prepared a cell containing a solution of caustic potash in which phosphorus and sulphur, both in sticks, were placed. Within half an hour the phosphorus was reduced to an oily mass, perfectly mobile, occupying the lower part of the cell; the sulphur was not at first affected. The temperature at first rose considerably—about 20°—but this soon passed off, and the solution returned to the temperature of the surrounding medium, varying from 56° to 60° F. During the first six days there was a constant development in small quantity of phosphuretted hydrogen in the spontaneously inflammable form, but after that time, although phosphuretted hydrogen still continued to be evolved, it no longer ignited spontaneously, this being probably due to the simultaneous development of sulphuretted hydrogen, which began to be exhaled in appreciable quantity about this time. At first the sulphur was little affected, but at the end of ten days it was found that at the point of junction of the phosphorus therewith there had occurred considerable loss of substance.

In the solution there were produced sulphite and phosphite, hyposulphite and hypophosphite, and slight traces of sulphate and phosphate of potassium.

At the end of three months the conditions were still much the same; the phosphorus was still fluid and mobile, the sulphur more eroded, the same products present in solution, though increased in quantity and somewhat altered in the ratio which the one salt bore to the other: due allowance being made for increase, the proportion of sulphate and phosphate was greater.

Another cell was prepared on the same principle, and both cells were then submitted to Mr. Hill, one of the assistants in Sir William Thomson's laboratory, to determine the amount of electricity developed, if any. The result far exceeded my expectations, for not only was electricity found to be developed, but a very considerable quantity thereof. The electromotive force, as registered by Sir William Thomson's electrometer, was found to be 162, which, compared with that of Daniell's battery, 120, shows a difference in favor of the sulphur and phosphorus of 42°. It was, further, also found that in the cell which had been in operation for three months, the reading of the scale was quite the same, so that from this cell there was derived an electric current of considerable intensity which had the advantage of being constant.

Wishing then to obtain again in its solid state the residuum of phosphorus which lay at the bottom of the cell, I removed the rolls of sulphur and the alkaline solution, replacing it by pure water, and washing till free of alkali. The phosphorus, under water, was kept for ten days perfectly undisturbed, but at the end of that time was as mobile as ever. A stick of solid phosphorus was then placed among the fluid mass without inducing solidification; on the other hand, the solid became liquefied in a short time. It was then cooled down to 34° F., but still remained fluid, so that I have it still by me in the same mobile, oily condition, without apparently any change occurring, though, since the removal of the alkali, nearly two months have elapsed. To what this is due I cannot say, though I believe it depends on the presence of some compound of sulphur and phosphorus, as both are present; though in what proportion I cannot at present state.

I am at present engaged in further observations on this and other allied subjects, the results of which I shall herewith make known.—*Chemical News.*

ELECTRIC RAILWAY SIGNALS.

The Southeastern Railway in England adopted a method of electric signalling as early as 1851, and the Charing Cross Railway about the same time adopted a method substantially the same.

In this method the signals are made on a bell, and the circuits operated by manipulating keys. In the central station is placed a signal bell operated by a local battery. Into this office independent wires run from various stations, and connect with independent relays inclosed in a box in such a manner that, when the circuit is closed or broken through a particular relay, the same will not only close the local circuit and tap the bell, but will, also, by releasing a catch, allow a button to spring up through the top of the box to indicate what station wishes to communicate. The specific information to be transmitted is then communicated by a specific number of taps on the bell. In some cases miniature electro-magnetic semaphores are used to convey the signals visually, and in some cases, also, pointers are used for the same purpose. The Southeastern Railway, three hundred and eight miles long, has about four hundred instruments in daily use, to a greater or less extent, on several other roads. The special advantages of this system over the ordinary system of telegraphing are not very apparent to the casual observer. In fact, it has certain disadvantages which it is not necessary here to point out.

On some of the roads in Russia an automatic system is used to a limited extent. There, at the stations, a small bell is placed, together with a pointer, in some cases. A man is stationed near, whose sole business is to watch those instruments and a clock hanging by. A train passing along will, by operating a circuit-closer, tap the bell for a moment. Should this fail to occur exactly at the prescribed time, a locomotive, kept at the station with steam up for the express purpose, is immediately started out in search of the belated train. Should the engine be found disabled, it is at once thrown from the track, and the fresh engine, taking the train, rushes on at lightning speed until the lost time is made up. Making time, regardless of consequences, seems to be the chief object of the Russian railroads.

We may now proceed to examine automatic signals more fully. In 1858, an English patent was granted to a Frenchman named Jean Joseph Etienne Lenoir. In this he proposed to use a disk signal attached to the lower end of a hanging lever, which lever was to be swung from one side to the other, carrying the disk signal before an orifice or away from it, to expose or conceal the same, by means of another vertical lever pivoted at its lower end. To this lever were attached two armatures, one at either side—two electro-magnets being placed on opposite sides of the lever to correspond with the armatures. He proposed to carry the battery on the train, one pole being connected to the ground through the wheels, the other to an insulated spring blade extending the whole length of the car on its outer edge. The line wire, from the two signal-magnets, had one end of each grounded; the other ends being carried to insulated posts or projections near the track, and at some distance from each other. In passing along, the "spring blade" of the car, coming in contact with one of the insulated posts, closes the circuit through one of the magnets, and thus, as is supposed, brings the signal into view, closing the circuit at another point through the opposite magnet reversing the signal. This signal is utterly unreliable, and doubtless could not be made to work at all without radical changes in its mode of operation, for cogent reasons. First, granting that the signal could be brought into position by charging the magnet for the short space of time indicated, there is nothing to keep it there, and the slightest jar would throw it out of position; secondly, charging the magnet merely while a car, moving fast, was passing the insulated post, would not swing the signal into position, to say nothing of its settling from its vibrations and remaining there.

An American inventor has fallen into an error similiar to Lenoir's, but one three hundred and seventy-five times more serious, and less likely to work, than his; in fact, into an absolute mechanical and scientific absurdity. He proposed, in brief, to swing his signal into position by having the train close a circuit for an instant, and when in position to hold it there by having a supplementary lever slip under the signal lever, by which means the signal could be held exposed as long as desired, or until the supplementary lever should be withdrawn by charging a supplementary magnet. This method, although deemed worthy of a patent by its projector, could not possibly be made to work, for the reason that it required the signal magnet to be charged at least five seconds in order to swing the signal into position to give the supplementary lever an opportunity to act, whereas, the wheel of a train running thirty miles an hour, in passing over a circuit-closing lever having a two-inch face, will hold the circuit closed only the one-two-hundred-and-sixty-fourth part of a second—not long enough to start the signal out of its state of rest in the slightest degree. It would be necessary to keep the circuit closed while the train was running, at the very lowest calculation, two hundred and twenty feet, in order that the signal should get into position at all.

A lady, named Alice Isabel Lucan Gordon, received an English patent in 1865 on electric signals, a leading feature in which was a short length of insulated rail laid between the regular rails. The engine was provided with a small insulated centrally located wheel, which, running on the central rail, would close the circuit through a battery on the train, and tap a bell at the station while the insulated rail and wheel were in contact. This lady also made provision for intercommunication on the train.

Albert Horwood received a patent in 1861 for a device in which he used three insulated rails about as long as ordinary rails; these he placed longitudinally between the rails of the track. Two upright bars on the engine, coming in contact with these rails, closed the circuit, and operated an instrument at the station and a pointer on the engine to indicate "blocked" or "clear," according to the position of the pole-changer at the station. It was only necessary that a careless laborer should connect two of the insulated rails by a shovelful of moist earth, or that a mischievous boy should lay a wet stick across them, in order to operate the instruments at the station. This, of course, is an insurmountable difficulty in this invention.

The next will be the final paper of the series, and will consider especially switch, drawbridge, and road-crossing signals, including the latest American improvements. Yours respectfully,

Wm. Robinson,

In the American Artisan.

A LEARNED REPAIRER.

On one of the railroad telegraph lines in the West, we will not be more explicit, the head repairer is a man of intelligence, active, sprightly, self-confident. Not long ago a new office was to be opened. To do this, usually some expert in the science of connections, sometimes the superintendent himself, has to go or be sent to make sure that the baby station is properly connected into the family, and all the arrangements decently made for its life and health and growth.

Our repairer saw a chance for glory. He asked permission to open the new office, claimed to be a good nurse, and knew exactly how to arrange every string. He had mastered Pope, he had an eye for mechanics, he could make a handsome joint, he knew a local like a book, he could open an office. Permission was given. Oliver Opus started on his mission.

After arranging the office table, planting the local with orthodox care, setting the magnet key and sounder in their proper places, Mr. Opus commenced his connections.

Firstly, the two air wires were neatly brought through the sash and led to the binding screws of the commutator or cut-out.

Secondly, a wire was led from the right side of the cut-out to the key; another from the key to the register; a third from the register to the local battery. Mr. Opus reviewed his work with mental approval. Yes, that is all right — key — register—battery. Yes, that must be correct.

Thirdly, a wire was led from the left side of the cut-out to the main circuit binding-screw of the relay, and another wire from the other binding-screw to the local! Beautiful! Every thing was certainly in circuit, key, register, battery and relay! Could anything be more perfect. It was early in the morning, and after a comfortable breakfast he returned to see if all was going well, but was confounded to find the operator and machinery in sad and utter silence.

Head Repairer. What is the matter with the battery?

Operator. Don't know. It seems all right. As it was made new this morning, guess its weak. Are you sure the wires are all O K?

Head Repairer. Oh, certainly; they are all right, you bet. Let her be a spell and she'll come up all right—after a while.

Mr. Opus thereupon went out to see the region around Ashley (the place was not named after J. N.), and about noon returned to the office.

Still the same ominous silence prevailed, and the operator wore a troubled face, and was holding a trembling hand on the adjusting screw, while the other was feeling tenderly at the magnet, which was wiggling sadly beside a dumb register.

Head Repairer. How does she work now?

Operator. Very weak, yet. Never a click, yet.

Head Repairer. (Looks carefully over the connections.) Well, by gosh, she's all right, anyhow, and the kussed thing ought to work. She'll come out all right yet, don't you be alarmed.

Opus went for another walk. Time, 5 P. M. H. R. returns to office. All silent. Operator much perplexed, magnet wiggling fast and excitedly. H. R. sadly remarks, "It takes that battery a deuced long time to come up!" Stirs it up. Shakes it. Kusses it, and uses very bad language generally. Has a bad headache, and thinks his stomach out of order. But the register don't wiggle. Not a wiggle, although it acts as if it wanted to and couldn't.

Seven P. M. The night train is due. Here it comes and off jumps the superintendent or his aid. What's the row here, he says, anxiously.

Head Repairer. Don't know, sir; but everything is on the square here, you better believe.

Superintendent is meanwhile smelling around and finds the register and local battery in the main circuit, and the local connections omitted. Is too polite to upbraid, but looks as if somebody had something to learn. Happily he did learn. Ashley was brought into the family and prospers. Mr. Oliver Opus can now open an office, and is specially careful of his local connections.

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CHEAP ELECTRIC BATTERY.

A CHEAP and most efficient battery may be constructed as follows:—For a cell use a large glass tumbler. Get a sheet of zinc (a thick plate if possible) almost as wide as the tumbler, and long enough to reach within an inch of its bottom, and a strip of sheet copper, somewhat narrower than the zinc plate, but twice as long. Take a strip of hard, well-dried wood, about 1½ inch wide, and long enough to extend across the top of the tumbler, and having made a sufficiently large mortise through its centre, into it fasten the zinc plate, by wooden wedges. Next, bend a copper strip into the form of a U, having the legs ½ inch apart, and fasten this upon the wooden strips so as to enclose the zinc without touching it. The whole system thus formed will sit firmly in the tumbler. To charge the battery, fill the cell nearly full of a saturated solution of bichromate of potash, and then add dilute sulphuric acid until a slight effervescence takes place. The zinc plate should be amalgamated. This battery works with remarkable vigor, being superior to Smee's or Daniell's, although not so constant as the latter. For further security the wooden strips should be varnished, and, of course, terminal wires must be soldered, one to the copper plate, and the other to the zinc. For the telegraphic apparatus an electro-magnet and a key are required. An electro-magnet is but a bar of soft iron wound with insulated copper wire, the winding being at all parts in the same direction. This may best be understood by taking a straight bar, and commencing at one end, and winding it throughout the whole length and back again; but as it is not convenient to bend the bar after being wound, it is first bent into the form of the letter U, and wound afterwards. A small bar of soft iron is to be fixed by a spring at a little distance from the free ends of the electro-magnet, and capable of motion, such that when the magnet is excited, the bar may be brought into contact with its ends, and thus make a "click," while the spring may carry it back when the magnet loses its charge. The key may consist of a metallic spring, having one end fastened upon a board in such a manner that when at rest the other end may be elevated about 1½ inch. Under the free end is a metal button, or merely a piece of wire so placed that the spring may be brought into contact with it by pressing its free end down. These things being arranged, the connections are made as follows:—By a copper wire, connect the zinc plate with the fixed end of the spring in the key; connect the button with one extremity of the electro-magnetic coil, and connect the other extremity of the coil with the copper plate. Then, whenever the spring in the key is pressed down, connection is complete between the coil and the battery, the magnet becomes charged, and the armature or small iron bar is drawn into contact, making a sharp "click;" when the spring is suffered to rise, contact and hence metallic connection is broken, the magnet loses its power, and the armature is carried back by the spring attachment.—*Scientific American.*

OBITUARY.

JOHN N. CHESTER.

It is our painful duty to record the decease of John N. Chester, of the firm of C. T. & J. N. Chester, of this city. Mr. Chester has for several months past endured an illness entailing upon him protracted and severe suffering, which he has borne with characteristic fortitude and cheerfulness. Of a naturally amiable and hopeful disposition, he maintained through all his sickness and suffering a confidence in ultimate recovery, which, unfortunately, has not proved well-founded.

His death was caused by a tumor in the cavity of his chest, probably the growth of some years, which no human skill or care could have prevented from a final fatal termination.

Mr. Chester was born in this city, on the 29th of September, 1820, and had, therefore, just completed his fifty-first year when he was called to his final rest. As the partner and principal business manager of the firm, he had become well known to the telegraphic community throughout the country, and was personally known to most of the leading telegraphers and telegraphic officials.

The firm of C. T. & J. N. Chester, in 1855, succeeded to the business established by Mr. John W. Norton, who, in the early days of the telegraph, was largely engaged in the manufacture and sale of telegraph instruments and supplies. From the corner of White and Leonard streets, where their business was first established, they soon removed to 104 Centre street, which building is owned by the firm, and where they have since remained.

Modest and unobtrusive in his disposition, John N. Chester had the faculty of securing the sincere friendship and good will of those with whom he was brought in contact, socially or in the way of business. He was a man of ability, and in all the relations of life was faithful and without reproach. Of a kindly disposition, he was always ready to listen to and sympathize *practically* with those who were in trouble and needed assistance. His charities were numerous but not ostentatious, and his Christianity was practical rather than demonstrative. As a son, brother, husband, friend and employer, he was without stain or reproach, and there will seldom be found as sincere and heartfelt mourners as assembled on Wednesday last at the Fourth avenue Presbyterian Church, in this city, to pay the last sad tribute of respect to his mortal remains.

He will be greatly missed, and it will be long before his place will be filled. Living he had but few, if any, enemies, and dying he is sincerely mourned by all who knew him. He leaves a wife, who is much prostrated by the crushing blow which has fallen upon her. His brothers, with whom he has for so many years been so intimately associated in business, can hardly realize that they will no longer have the aid of his counsel and assistance, which have never before failed. They have the earnest sympathy of their friends and acquaintances in this their hour of affliction.

In bidding farewell to the friend whom we shall never again greet upon earth, it is with no conventional or unmeaning phrase that we record his virtues and the sorrow which is felt at his departure. He is now at rest. The cares of earth are past, and if there be a happy future beyond the grave, he will, no doubt, be blessed in its enjoyment.

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GOOD SENSE.—The great trouble among American youth is the lack of application and thoroughness in what they undertake. Anything that cannot be learned with superficial study, is given the go-by for something less tedious and irksome. Study and hard labor are looked at from the wrong standpoint; and as a consequence, the clerkship ranks are full of unemployed and half-starved young men, and the professions are overflowing with mediocrity, while mechanics find plenty of work at living prices. The evil spoken of is felt seriously.. Those who work at a trade do it in so loose and careless a manner that they are not competent to do the work they promise to do. Among the loudest declaimers for the rights of labor are men and women who can claim no right that belong to labor wall performed.

CURIOUS METEOROLOGICAL FACTS.

In the fourth meteorological Report by Professor J. Espy, of Washington, D. C., we find the following instructive generalizations :

1. The rain and snow storms, and even the moderate rains and snows, travel from the west toward the east in the United States, during the months of November, December, January, February, and March, which are the only months to which these generalizations apply.

2. The storms are accompanied with a depression of the barometer near the central line of the storm, and a rise of the barometer in the front and rear.

3. This central line of minimum pressure is generally of great length from north to south, and moves side foremost toward the east.

4. This line is sometimes nearly straight, but generally curved, and most frequently with its convex side toward the east.

5. The velocity of this line is such that it travels from the Mississippi to the Connecticut river in twenty-four hours, and from the Connecticut to St. John, New Foundland, in nearly the same, or about thirty-six miles an hour.

6. When the barometer falls suddenly in the western part of New England, it rises at the same time in the valley of the Mississippi, and also at St. John, Newfoundland.

7. In great storms the wind for several hundred miles on both sides of the line of minimum pressure blows toward that line directly or obliquely.

8. The force of the wind is in proportion to the suddenness and greatness of the depression of the barometer.

9. In all great and sudden depressions of the barometer there is much rain or snow ; and in all sudden great rains or snows there is a great depression of the barometer near the centre of the storm, and rise beyond its borders.

10. Many storms are of great and unknown length from north to south, reaching beyond our observers on the Gulf of Mexico and on the northern lakes, while their east and west diameter is comparatively small. The storms therefore move side foremost.

11. Most storms commence in the "far west," beyond our most western observers, but some commence in the United States.

12. When a storm commences in the United States, the line of minimum pressure does not come from the "far west," but commences with the storm, and travels with it toward the eastward.

13. There is generally a lull of wind at the line of minimum pressure, and sometimes a calm.

14. When this line of minimum pressure passes an observer toward the east, the wind generally soon changes to the west, and the barometer begins to rise.

15. There is generally but little wind near the line of maximum pressure, and on each side of that line the winds are irregular, but tend outward from that line.

16. The fluctuations of the barometer are generally greater in the northern than in the southern parts of the United States.

17. The fluctuations of the barometer are generally greater in the eastern than in the western part of the United States.

18. In the northern parts of the United States, the wind, generally in great storms, sets in from the north of east and terminates from the north of west.

19. In the southern parts of the United States, the wind generally sets in from the south of east and terminates from the south of west.

20. During the passage of storms the wind generally changes from the eastward to the westward by the south, especially in the southern parts of the United States.

21. The northern part of the storm generally travels more rapidly toward the east than the southern part.

22. During the high barometer on the day preceding the storm, it is generally clear and mild in temperature, especially if very cold weather preceded.

23 The temperature generally falls suddenly on the passage of the centre of great storms, so that sometimes, when a storm is in the middle of the United States, the lowest temperature of the month will be in the west on the same day that the highest temperature is in the east.

Some of the storms, it is true, are contained entirely, for a time, within the bounds of my observers, and in that case the minimum barometer does not exhibit itself in a line of great length, extending from north to south, but it is confined to a region near the center of the storm, and travels with that centre toward the east.

From these experiments it may safely be inferred, contrary to the general belief of scientific men, that vapor permeates the air from a high to a low dew point with extreme slowness, if, indeed, it permeates it at all ; and in the meteorology, it will hereafter be known that vapor rises into the regions where clouds are formed only by being carried up by ascending currents of air containing it.

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HOW TO MAKE A LOCAL BATTERY AND KEEP IT IN WORKING ORDER.

Take two jars (glass is best). Put them in neat boxes made for each one, with doors to open on the side (not top). Secure the boxes to the wall so they will be insulated from the ground and each other. The boxes should be made as tight as possible, so as to prevent evaporation. Fill the jars two-thirds full of rain or soft water ; add as much sul. copper as will dissolve, and no more. Take two *good* porous cells entirely free from copper deposits, (if any copper in them it must be removed with sul. acid) fill them with rain or soft water. Now procure a good stiff piece of rubber belting, and cut out covers for the porous cells ; cut a hole in them to *fit* the top end of zincs; put the top end of zinc in the hole, and put on the clamp, which will hold the zinc in its place and insulate it from the cell, which will prevent copper deposits. The covers fit tight and prevent evaporation from the porous cells—a great desideratum. When the battery becomes weak, add one teaspoon full of sul. copper to each jar, which will raise your circuit as strong as you wish in twenty seconds.

Never allow the deposits in the bottom of porous cells to touch the zincs, as it will form metalic connection, and cause copper deposits in hot weather. A battery kept in this manner, will consume from one to two pounds of sul. copper per quarter, (it takes more copper in a cold room) and a pair of common flat zincs will last from eight to twelve months.

Never allow the liquid in the jars to rise as high as the liquid in the porous cells. When the jars get too full, draw off some of the solution with a syphon. Never throw away the solution in the porous cells. But when you clean your porous cells, pour off the clear liquid into a suitable vessel ; then clean the cell and pour the clear liquid back into the cell, fill up with soft water, put in your zinc, and your battery will work instantly.

The writer has had nineteen years experience with batteries, and nine years of that time has kept a battery at his own expense, and has tried every conceivable manner of keeping a "local up," and finds the foregoing the cheapest, cleanest, and gives less trouble, than any other. E. Dudley.

Turney Mo., August 25th 1871.

San Juan, South Cal., September 18, 1871.

To the Editor of the Journal of the Telegraph :

In No. 19 of the Journal of the Telegraph appears a paragraph which I quote:—

"This may be called an empty honour to the man, but it is significant of the kindly instincts of the neighborhood and the pressure of civilization, which must soon lift a semi-barbarous people to national significance and ultimate dignity. What Napoleon and Maximilian failed to do, the silent operation of the wires, commerce, and proximity to active, intelligent, free people, will soon accomplish."

I do not believe that the above originated with you, because you are impartial and discriminating in your views. However, I will offer a few remarks. It is improper that we should enter into a lengthy controversy discussing the failings and merits of both people, nor draw any parallels between both nations, as it would embitter our feelings. But it is becoming to render every one his due.

You call the Mexicans a semi-barb rious people. Now, Sir ; the word civilization has a positive and definite meaning, and conveys a *certain* idea of the condition of a people. More than three hundred years ago the Aztecs were considered civilized, at a time that Christianity, arts and science (as we know them), were unknown to them. If such were the impressions of the calmer historians of those days, do we deserve to be called semi-barbarous, now that we cultivate modern sciences, arts and literature as well as any living people?

Let me define civilization in the words of an eminent man : "Our manners, our civilization, and all the good things connected with manners and civilization have, in this European world of ours, depended for ages upon two principles—I mean the spirit of a gentleman, and the spirit of religion." We, the Mexicans, are next to none, in good manners and in the unity of religious belief.

The spirit and condition of things are either expressed or implied, and you seem to believe and *imply* that *wires* will carry civilization into Mexico, after the failure of Napoleon and Maximilian. Wires are, indeed, new and extraordinary agents of civilization, because it is an incontrovertible historical fact, that *Christianity alone*, and the arts and sciences inculcated by it, are, and have alway been, the only agents of modern civilization. History proves it. We cultivate all the modern sciences, but we had first to become Christians. However, I concur with you in your last clause, in this respect, that the *wires* will accomplish the overthrow and downfall of Mexican nationality. Yours truly,

Y. P. Vellegas.

The term "semi-barbarous" was infelicitous and we recall it. Yet civilization has not completed its Mexican task.

◆

The British Government require their wires to be:

1. No. 8 Birmingham wire guage.
2. Annealed and galvanized. Capable of elongation 18 per cent. without breaking.
3. Not to break with less strain than 1260 lbs., and with a length of six inches to bear a twist of 18 times upon itself.

◆

The old firm of James W. Tucker & Co., Paris, and Tucker, Andrews & Co., of New York, will be dissolved on the 1st proximo, by mutual consent, James W. Tucker retiring. The business of the house will be continued by George Walker, formerly Vice-President of the Western Union Telegraph Company, and well known in financial circles, Edward R. Andrews, of the old firm, and Henry Turnbull, under the style of Walker, Andrews & Co., No 52 Wall street, and Andrews & Co., No. 10 Place Vendome, Paris.

Journal of the Telegraph.

This Journal is issued on the 1st and 15th of each month. Its circulation is 6,500. It goes to every State, Territory, and Province on the continent. It is fast becoming a necessity, and is already welcomed as a friend. No better medium for advertising exists.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—

JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, OCTOBER 16, 1871.

WESTERN UNION TELEGRAPH CO.

ANNUAL ELECTION.

The following persons were unanimously elected Directors of the Western Union Telegraph Company at the annual election, held Wednesday, October 11, at the Company's office in New York:

BOARD OF DIRECTORS.

Hugh Allan,
James H. Banker,
Nathan A. Baldwin,
Wm. D. Bishop,
Horace F. Clark,
Ezra Cornell,
Alonzo B. Cornell,
Harrison Durkee,
Wm. E. Dodge,
Sheppard Gandy,
Norvin Green,
Augustus W. Greenleaf,
John A. Griswold,
Wilson G. Hunt,
George Jones,
C. Livingston,
Edwin D. Morgan,
William Orton,
O. H. Palmer,
E. S. Sanford,
Augustus Schell,
Hiram Sibley,
Z. G. Simmons,
John Steward,
Moses Taylor,
Daniel Torrance,
George Walker,
E. B. Wesley,
Stillman Witt.

At a meeting of the newly elected Board of Directors the following officers were elected:

OFFICERS.

William Orton, President.
A. B Cornell, Augustus Schell, O. H. Palmer, } Vice-Presidents.
George Hart Mumford, Secretary.
R. H. Rochester, Treasurer.
W. H. Abel, Auditor.

EXECUTIVE COMMITTEE.

William Orton,
Horace F. Clark,
John Steward,
E. B. Wesley,
E. D. Morgan,
O. H. Palmer,
James H. Banker,
A. B. Cornell,
Augustus Schell,
A. W. Greenleaf,
Harrison Durkee.

Mr. Orton had sufficiently recovered to be present at the organiztion. The votes at the annual meeting represented over twenty-nine millions of the capital.

◆

THE CHICAGO FIRE.

By the instrumentality of the telegraph, the terrible conflagration which has just devastated Chicago and laid her fairest portion in ashes, is known throughout the world. No special record of its details is at present possible. Even respecting the features of it, which would be properly prominent in this paper, little can now be said.

The fire commenced at 10 P. M., October 8th. Accounts agree that it could have been put out promptly by a fresh and vigorous fire department. But the moment of possibility passed, the firemen were exhausted by previous toil, a fresh south wind gave intensity to the heat, and by 2 o'clock A. M., October 9th, the telegraph offices and all public buildings, banks and hotels, were wrapped in flames. It required only a day to lay the whole of the most valuable portion of the city in ruins.

Fortunately, the Western Union Company had premises on the corner of Sixteenth and State streets to which business was at once transferred, and connection with the East and South maintained with more or less regularity. Every thing was done which skill, energy and heroic fidelity could accomplish. All the connections are already complete, although some time must elapse before the former facilities of service are restored.

Of course much suffering was the first immediate and necessary result of this terrible conflagration. Of the 200 persons in the Company's service, a considerable number had families, and many undoubtedly resided in the destroyed portion of the city. To what sufferings these have been exposed, we have, as yet, no detailed account. It is only known that unparalleled sorrow reigns in a city where over 100,000 persons are homeless and fed on charity, where hundreds of children have died on the streets from exposure and want, and that in this black night of an awful calamity, our brethren and sisters have been more or less engulphed. We presume that there was not an operator throughout the Union that did not at the instant feel the woe and desire to aid them. Eight hundred dollars were gathered and sent from the offices in California in a single day, and hurried on to Gen. Stager. Many other sums will no doubt rapidly follow. In a few minutes three hundred dollars were subscribed in the New York offices, and placed at our disposal for Chicago. In this good work the ladies have been prompt and liberal, as they always are where suffering is known to be. If any choose to make us the depository of their gifts, we shall be glad to serve them.

On behalf of the Western Union Telegraph Company, General Stager was promply ordered to supply to all operators such comforts as were necessary at the Company's expense. Acting on this direction, Gen. Stager ordered a car load of provisions from Cleveland to secure against extortionate demands for food, and to fully provide for his large staff of operators. The operators of St. Louis nobly sent on supplies of clothing and provisions, and other cities have no doubt done generously. It is exceedingly gratifying to see this hearty sympathy and eagerness to render service in the dark hour which has enclouded so many hearts. Too much cannot be sent on. The Company will do its full duty to its employees, although itself one of the sufferers, but there is still enough to do to render every offering acceptable. The Company cannot restore the homes which have been swept away, or the numerous articles of raiment and comfort which the fire has torn from those who valued and needed them.

In answer to an enquiry of Gen. Stager, we have the following:

To J. D. REID: Send the money to me. I will dispose of it as the needy may require, and on the order of the committee of employees.

A. STAGER.

◆

The following is the Staff of the

WESTERN UNION TELEGRAPH CO., CHICAGO.

OPERATORS' DEPARTMENT.

R. C. Rankin, manager,
F. C. Swain, ch. operator,
G. C. York, assistant,
H. C. Maynard, "
C. G. Sholes, "
C. H. Summers, operator,
J. N. Crittenton, "
S. C. Mason, "
L. C. Springer, "
C. H. Lithgow, "
F. E. Merrill, "
C. D. Meserve, "
A. L. Baker, "
A. M. Valentine, "
F. E. Angel, "
T. L. A. Valiquet, "
J. T. Farrell, "
C. H. Patch, "
C. H Parr, "
H. H. Hunt, "
E. N. Snyder, "
J. E. Pettit, "
E. S. Patten, "
G. W. Huddleston, "
C. E. Wilkinson, "
G. F. Richardson, "
W. H. Sisson, "
L. E. Warner, "
M. Ryan, "
E. P. Porter, "
C. H. Kelley, "
C. W. York, "
M. A. Smith, "
C. B. Burch, "
A. T. Plank, "
E. Lawson, "
D. McD. Hall, operator,
E. M. Fox, "
H. E. Wasson, "
A. Lincoln, "
J. C. Dorchester, "
C. S. Johnson, "
G. E. Hinman, "
G. D. Merrill, "
T. C. Gilpin, "
Jno. C. Mason, "
W. C. Long, "
W. W. Ashley, "
F. B. Knight, "
C. F. Gooding, "
A. J. Long, "
E. J. McRavy, "
William Walsh, "
A. M. Hobbs, "
A. Nixon, "
A. M. Sill, "
D. M. Tillotson, "
H. Giddings, "
Sophia Redrup, "
J. E. Phelps, "
M. Clark, "
Lizzie Vessey, "
C. M. Green, "
F. A. Randall, "
N. C. Griswold, "
E. Stephens, "
H. McMilan, "
W. D. Sargent, "
F. E. Angal, "
P. Kearney, "
J. Fitzpatrick, "
Eliza Stone. "

RECEIVING DEPARTMENT.

A. Curry, receiver,
L. Penoyer, assistant
C. Catlin "
J. M. West, "
C. E. Bennett, "
C. B. Morgan, clerk,
W. M. Willis, "
C. P. Van Pelt, "
D. E. York "
B. Wygant "
W. Frazier "
John Quinn, "
J. O'Conner, "
G. W. Felton, bookkeeper,
G. B. Simpson, assistant,
S. F. George, "
T. J. Loesch, "
C. C. Parmalee, "
R. W. Chapman, "
Arthur Grey, ass't. bookk'pr.
J. A. Tobin, "
John Young, clerk,
Wm McMilan, "
James McMannus, clerk
Alex. Scully, "
W. Washburn, check boy.
F. Lithgow, "
Joe Quinn, "
Henry Miller, office boy.
A. Carroll, "
George Shaw, "
H. Taige, "
Fred Drandorf, "
L. F. Fish, "
J. J. O'Leary, "
D. H. Mason. "
Emma Anderson, office girl,
A. C. Wood, battery man.

S. Levis, porter,
George Peal, janitor.

56 messengers.

AT BRANCH OFFICES.

S. C. Mason,
H. U. Plum,
J. W. Atwell,
S. L. Robinson,
C. C. Robinson,
J. T. Richards,
Thomas Singer,
S. L. Goldsmith,
L. J. Amsden,
C. B. Gulles,
F. C. Nye,
C. H. Chase,
F. Nugent,
W. C. Applegate,
J. N. Flynn,
Chalres Hemlin,
A. O. Connor.
J. B. Fraley
T. T. Childs.
M. A. Buyck.
G. W. Graham
R. Woolsey.
T. J. Lynch.
T. Richardson.
A. Nixon.
W. J. Howten.
N. E. Howe.
A. Yetter.
And at 17 other stations, names not in our possession.

DEATH OF WILLIAM H. HILL.

We have only time to announce the death, Sunday evening, October 15th, of William H. Hill, manager of the Delivery Department, New York Central Office. He will be greatly mourned and missed. He was one of the earliest members of the Telegraphers' Life Insurance Association, and one of the Executive Committee. Death thus comes very close to us.

◆

The house of Gray, Barton & Co., Chicago, has sustained no injury from the great fire, and are, of course, ready to supply all orders.

◆

BLISS, TILLOTSON & CO., CHICAGO.

The Telegraph Supply House of Bliss, Tillotson & Co., though burned to the ground with all its contents, excepting books and a few instruments, resumed business within forty-eight hours after the fire. Their present location is at 295 West Randolph street, Chicago. Their business will, of course, be continued, and they will be, as heretofore, amply backed up by the house of L. G. Tillotson & Co., in New York.

◆

THE COOPER SCHOOL OF TELEGRAPHY.

One of the most sublime sights which we have ever been honored in witnessing was the last commencement exercises of the Cooper Union Institute, N. Y. The large audience room was crowded. The foremost men in New York were on the platform. The honored patron and father of the institution, sat there like a patriarch among his family, enjoying at his eightieth year the presence of those to whom he had become a great and perpetual blessing. The large assembly had met partly to celebrate the commencement—chiefly to offer a tribute of homage and gratitude to Peter Cooper. Never was a man more worthy of it. In the most quiet and unostentatious way, Mr. Cooper has developed his grand scheme of gratuitously furnishing useful technical instruction to young persons. The number of these is already very great. It was not the least imposing part of the commencement service, the spectacle of so noble a consecration of riches honorably earned. In an age so sordid, at a time when the desire for wealth seems in danger of utterly depraving the public conscience, it was refreshing to see one man true to his great trust, and performing during the mellow years of an honored and lengthened life so noble a public service. Fulton, Morse, Cornell, Cooper and Vassar, men who have enriched mankind by their inventions and beneficences, are a proud heritage to any state and nation. No fame can be more secure.

We cannot dwell on the scene and services of that night, or on the affectionate and wise address of Mr. Cooper. We merely refer to the fact, that to the telegraph department especially, has he latterly devoted much of his thoughts, and in the success of the female department taken much pride. This latter department has been singularly successful, and Mr. Cooper mentioned the fact with most grateful emphasis. The following is from the annual report, to which Mr. Cooper made special and delightful reference:

THE FREE DAY SCHOOL OF TELEGRAPHY FOR WOMEN.

Number of Applicants during the year	275
Number of Pupils during the year	96
Number who retired voluntarily	15
Number dismissed	4
Number graduated	55
Number who obtained situations	40
Number waiting situations	12

Average wages earned by female operators per month, from $30 to $70.

Miss Lizzie H. Snow, Manager.

FEMALE SCHOOL OF TELEGRAPHY.

The following pupils received Diplomas:

Miss Nellie Barbour,
" Emily Judge,
" Clara A. Moore,
" Elizabeth A. Ward,
Miss Louise Dubois,
" Jennie Walton,
" Carrie Thayer,
" Louise P. Pine,
Miss Kate Marriott.

To this useful department Miss Snow still gives her person attention, and many are being fitted by careful training for actual employment. It is a profession peculiarly suited to women to a certain limited, yet very large, extent, and there can be no doubt that hundreds of eligible young women will yet be needed, for even the social uses to which the telegraph is yet to be largely put. There is no sight more suggestive of social industry than the elegant and orderly apartment where Miss Snow, with her 30 assistants, perform their accustomed duties. How handsome they all are, we do not say, for, since June 10th, we have been unable to intrude, lest our good friends there might imagine we came to collect payment of the kiss we gave for them to Professor Morse, and which some, we doubt not, would be glad to redeem.

◆

Mr. F. L. Pope has received a number of subscriptions for relief at Chicago, which he will immediately remit, and offers to be the medium of transmission for all who desire it. We do likewise. We omit names, for all have given generously and according to their ability.

◆

"Brooks, of Philadelphia, has solved the difficulty of Line Supports by his Paraffin Cups."—*London Engineering.*

◆

The bichromate solution, where the sulphuric acid is not in excess, gives off no fumes, and is inoffensive to health.

◆

We are pleased to learn that the firm of Chester, Patrick & Co., of Philadelphia, have extended their manufactory to meet with the demands of the times, and their increasing business, and have also become the agents for the Wilson Patent Electric Apparatus, for the lighting of churches, theatres and public halls. They have just completed the putting in of this rapid and easy mode of illumination in the Academy of Music, Philadelphia.

This apparatus is conceded to be the best and cheapest of the kind in use, and is the same as that adopted by the Government, and now used in our halls of legislation at Washington, as well as in some of the principal buildings in New York city. Messrs. Chester, Patrick & Co., are old telegraphers and thorough electricians, and any work coming into their hands will be promptly attended to and performed in a workmanlike manner.

We bespeak for them great success in business, which their energy, perseverance and ability merit.

◆

NEW CENSUS AND PATENT LAWS.

We are indebted to Munn & Co., publishers of the *Scientific American*, New York, for a neat little bound volume of 120 pages, entitled as above. It contains the complete census of 1870, showing the population, by counties, of all the States and Territories, with their areas, and the population of the principal cities. Also, the new patent laws in full, with forms, official rules, directions how to obtain patents, copyrights, regulations for trade-marks, assignments, how to sell patents, etc. Also, a large variety of valuable information relating to water-wheels, steam-engines, and other mechanism, with many useful tables and recipes, 175 diagrams of mechanical movements, etc. We advise every body to send for it as above. Price, 25 cents. A more valuable compendium, for so small a price, has rarely been published.

Executive Office,
Western Union Telegraph Company,
New York, October 14, 1871.

EXECUTIVE ORDER NO. 129.

To all Offices:

Mr. R. H. Rochester, formerly Assistant Treasurer, has been duly elected Treasurer of this company, and will hereafter be recognized accordingly.

O. H. Palmer, Vice-President.

◆

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

Executive Office,
Western Union Telegraph Company,
145 Broadway, New York,
October 15, 1871.

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Oct. 1, the date of the last tariff order.

Managers are hereby required to enter these changes in their tariff book as soon after the receipt of the Journal as possible.

NEW OFFICES.

* Abbeville, S. C.
* Anderson, S. C.
237 Bear Creek, Ga.
Cheyenne Wells, Col. Tariff same as Arrapahoe, Col.
396 Clarksville, Iowa.
467 Cherryvale, Ks.
140 East Foxburgh, Pa.
123 Garret, Pa.
47 Greensburg, N. J. Heretofore an other line office.
359 Kimswick, Mo.
191 Lexington, Richland Co., O., re-opened
Monotony, Col. Tariff same as First View, Col.
370 Mine La Motte, Mo.
64 Princess Anne, Md., re-op'd
* Silver City, Utah.
477 Vinita, Ind. Ter.
Wisner, Neb. Tariff 75c. more than Omaha.
* Westville, Conn.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Abbeville, S. C.,	75	5	Columbia, S. C.
Anderson, S. C.,	75	5	Columbia, S. C.
Silver City, Utah,	100 for 10 words, and 40 cents for each each additional five words or less from Salt Lake City, Utah.		
Westville, Conn.,	20	1	New Haven, Conn.

OFFICES CLOSED.

Arrapahoe, Col.; Bagdad, Ky.; Bingham, Me.; Drakesville, Iowa; First View, Col.; Hopefield, Ark.; Idaho, Col.; Madison Bridge, Me.; No. Conway, N. H.; Pamplina, Va., and Sloan's, O.

SUMMER OFFICES CLOSED.

Alleghany, Va.; Cornwall, N. Y.; Healing Springs, Va.; Hot Springs, Va.; Montgomery White Sulphur Springs, Va.; Rockbridge Alum Springs, Va.; Rockbridge Baths, Va.; Sweet Chalybeate Springs, Va.; Warm Springs, Va., and Old Sweet Springs, W. Va.

GENERAL INFORMATION.

Messages *from* Tuskaloosa, Ala., via Chattanooga, Tenn., or Meridian, Miss., should be checked against the office thus indicated. There is an "Other Line" office at Tuskaloosa, which occasionally takes business for points on W. U. lines.

Attention is called to the fact that a number of offices still continue to check points on Erie Railway as other lines. They should be checked direct. See Journal, March 15, 1871.

The name of the office heretofore known as Swan or Swan Creek, Ill., has been changed to Youngstown, Ill.

The P. O. address of Port Johnson, N. J., is Port Johnson, care of Bergen Point, N. J.

Alma, O., square 221, is in Henry Co.

OFFICES HAVING "SPECIAL SHEET A,"

Will hereafter check Geneva, O., same as "special rate" to Ashtabula, O., and Perrysburg, O., same as "special rate" to Toledo, O.

William Orton, President.

IMPROVEMENTS IN TELEGRAPHY.

The London *Times* of the 30th of January last described a telegraphic instrument invented by Mr. Herring, constructed to produce the dot and the dash of the Morse code in such a manner that one could never be mistaken for the other. This was effected by the use of two distinct levers—an arrangement which also permitted the dash to be made vertical instead of horizontal, and to be produced instantaneously instead of by continued pressure, thus saving the time of the operator, and diminishing the length of the message slip. The authorities of the British Post Office took exception to Mr. Herring's first instrument because it was intended to print. He then arranged it to emboss, and it was next objected to because it would not print. The latter objection seemed to be the one most likely to be insisted upon; and Mr. Herring has now removed it by completing a printing instrument of a very superior character.

In this instrument the slip of paper on which the message is received is made to travel by clockwork in the ordinary way. It passes directly over a thin metalic disc, placed tranversely to the course of the slip, revolving on an axis, and dipping into an inkwell, over the paper is a lever terminating in a broad style placed vertically above the disc, so that the descent of the lever compresses the slip of paper between the disc and the style. The lever is double, in the sense that its central portion, carrying the central portion of the style, can be acted upon either independently of the lateral portions, or together with them. In the former case, only the narrow central portion of the style descends, and the slip of paper is pressed upon the inking disc at only a single point of contact, which produces a dot. In the latter case the style descends as a whole, and having a concave edge, it presses the paper into contact with the disc by more or less of this edge, thus producing a vertical dash.

Their is an adjusting screw, by which the inking disc may be raised or lowered at pleasure, and, by raising it, the length of the contact surface, and hence the length of the dash, may be increased at the pleasure of the operator. The pressure of the style stops for the moment the revolution of the inking disc, upon the immediate recommencement of which the ink supply depends. Mr. Herring has, therefore, placed upon the axle of the disc a box containing a spiral spring so arranged that when the disc itself is checked the power of the clockwork coils the spring. The moment the disc is released the coiled spring gives the necessary impulse to produce immediate revolution.

The operator is furnished with two keys, one of which commands the central or dot portion of the lever, the other the lever as a whole. One, therefore produces the dot, and the other the dash, and no mistake can occur between the two except by the use of the wrong key. The printing is remarkably clear, distinct, and compact. The instrument is worked with a double current.

Mr. Herring has also made subsidiary improvements of importance, especially with regard to the relay, which promises to add to the usefulness of his instrument.

◆

HOW TO GET ON IN LIFE.

A young man writes to us that he has had "ten years' office experience," we suppose as a clerk or bookkeeper, during which time he has saved "the sum total of $75," which is his all. He wishes to settle in some "growing young town and grow up with it." He is evidently sincere, and his letter shows that he is not deficient in ability and has some good sense. We therefore say to him, plainly, that success in life does not come in that way. No man finds a fortune by chance, nor can he "grow" into a state of prosperity merely by planting himself in a fresh virgin soil. Everything in life worth having is wrestled for and acquired through severe labor and self-denial. It is a great mistake to suppose that the failures of aspirants in this line come from adverse surroundings. Circumstances have much less to do with material prosperity than is generally supposed. Favoring conditions may accelerate the acquisition of an estate, but the same application and self-denial will guarantee the final result under any conditions. There are exceptions, of course; but this is the rule. A man without a family, who has been toiling in New York for ten years, and has laid up but $75, would not "grow up" into anything better, even amid the stimulus of that wonderful activity which marks the youth of a thriving town. The accretion that comes upon a man who waits to grow up by outward helps, is only the overlaying of rust and canker that gnaw out the vitals. The true growth is that which comes from within, and employs every faculty in the earnest effort. Nearly all of our young men make the same mistake which our correspondent confesses—they spend too large a proportion of their earnings for adornments and unhealthy indulgences of the baser appetites. Fine clothes, jewelry, cigars, liquors, pleasure hunting, and other costly or vicious habits, waste no inconsiderable portion of their annual income. We heard a man spoken of the other day as one who had been remarkably "lucky" in establishing himself in a comfortable home, and that was the only word used to distinguish between him and an associate who had more brilliant talents, but failed of success. There was no luck in the matter, for we knew them both. They both were married, without children, and each entering upon a salary of $1,000 per annum, went about the same time to look for board in Brooklyn. The "unfortunate" man took board for himself and wife at $20 a week, which he said was the cheapest at which he could get a comfortable room in a first class house. The "lucky" man looked for some time until he found clean, healthy quarters in a third story room at $7 a week for the pair, his wife to do her own sweeping and make her own bed. He lived within his income and laid up money from the start; the other run in debt and became embarrassed from the same hour. There is no secret in such histories; he who runs may read them. If any one assumes that the nobler part is to "enjoy life" as we go; and that the acquisition of an estate, the foundation of which is laid in early self-denial, and the structure built in patient toil with the same prevalent spirit ever present, is an ignoble ambition, we shall not argue the case. But we do say that those who desire this result can pursue it safely and surely in no other way, and if a man after knowing what it will cost, will not pay the price for it, he should not grumble at the fates, nor murmur against a discriminating Providence.—*N. Y. Journal of Commerce.*

◆

Singular Suit Decided.—A dispatch from Silver Creek says: "The action commenced, Aug. 28, by the trustees of the village of Silver Creek, N. Y., against the Atlantic & Pacific Telegraph Company, for damages to shade trees within the corporation limits, caused by the repairer trimming of said trees in order to clear the wires, came up, to-day, before Squire Andrews, when the case was withdrawn, the plaintiffs having satisfied themselves that the Telegraph company have the legal right to trim trees sufficient to give their wires free passage."

AMMONIA AS A MOTOR.

Several months ago we described the operation, at New Orleans, La., of a street car propelled by ammonia. The mechanism, we believe, was found on trial to require rearrangement, and, the necessary changes having been made, now operates, it is said, to better advantage than before.

Liquefied ammonia, when subjected to a heat of sixty degrees Fahrenheit, turns to a vapor which produces a pressure of sixty pounds to the square inch. This pressure is applied like steam, and is subject to the same controlling influences. When intended to be used for the purpose of propulsion, the ammonia is poured into a system of tubes deposited in a tank of water in such a way that the gas which passes through the cylinder, instead of escaping into the open air, may be carried through the exhaust pipe and be absorbed by the water. In this manner the ammoniated water is preserved, and, being redistilled, is capable of being used over again several thousand times, wearing out only at the rate of twenty-five per cent. per annum. The gas is so readily absorbed by the water that it prevents any disagreeable smell or noise of concussion with the air. At the end of each trip the tubes are refilled from a stationary reservoir of liquid ammonia, and during the journey the heat lost by the tubes is acquired by the water in the tank, which reimparts it, and prevents the ammonia from falling below the boiling temperature.

The report of the Examining Committee, headed by General Beauregard, approves of the invention in terms which are too indefinite to be conclusive.—*Scientific American.*

◆

We have received the following card:—

"Jeffersonville, Madison and Indianapolis Railroad.—Daultin Wilson, agent and operator, Greenwood, Indiana. Uniform courtesy and civility toward patrons of the road is my motto."

That man will succeed.

◆

We learn from Providence that Walter Phillips, whom Prof. Morse presented a gold pen for rapid receiving, and who is now Editor of the Morning Herald, duplicated himself, Sept. 4th, in a handsome model weighing nine pounds. Providence is kind to Mr. Phillips.

◆

BORN.

Coyle.—M. C. Coyle, Manager W. U. T. Co., Kent, Ohio, September 27th, a fine daughter, (10 pounds), first child.

Morgan.—October 7th, to Lew D. Morgan, Agent Indianapolis and Vincennes R. R., and Manager W. U. Telegraph office, Spencer, Ind., a black-haired, blue-eyed daughter, weight ten pounds.

Weaver.—To T. D. Weaver, Manager of W. U. Telegraph office, Greene, N. Y., July 1st, 1871, a daughter.

MARRIED.

Fraser—Slocumb.—At St. Andrew's Church, Darien, Georgia, on the 19th of August, by the Rev. Robert Clarke, William Fraser, of Galt, Canada, Manager of Darien Telegraph Line, to Rosa W. S., daughter of the late John R. Stanford, of Clarkesville, Georgia.

Pierce—Stiers.—At the residence of the bride's father, Haydenville, Ohio, Wednesday morning, September 6th, 1871, by the Rev. R. D. Morgan, Mr. O. L. Pierce, Agent C. & H. O. R. R., and Manager W. U. T. office at above place, to Miss Irene Stiers. No cards.

Pearse—Browne.—On Tuesday, September 26th, at the residence of James A. Wright, Esq., in Moravia, N. Y., by the Rev. Edwin Benedict, Mr. W. C. Pearse, Manager W. U. T., of Waverly, N. Y., and Miss Lizzie A. Browne, of Waverly, N. Y. No cards.

DIED.

Chester.—On Sunday, October 1st, at the residence of his father-in-law, Walter Harris, Esq., Elizabeth, N. J., John N. Chester, son of the late Thomas L. Chester, of New York.

CHESTER, PARTRICK & CO.,

Manufacturers and Dealers in all kinds of

Telegraph Instruments and Supplies,

No. 38 South Fourth St., Philadelphia,

Keep in Stock, or will manufacture to order,

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REPEATERS,
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Also, SILK, COTTON COVERED, COMPOUND and IRON WIRES, from the best manufacturers in this country and Europe, among them the RENOWNED Chester A 1 Wire, which has proven by tests to be the very best in the market.

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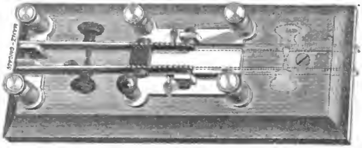
KERITE WIRE,
BRAIDED AND WOUND OFFICE WIRE,
GUTTA PERCHA OFFICE WIRE,
SWITCH CORD,
CALLAUD BATTERY,
DANIELL BATTERY,
GROVE BATTERY,
BUNSEN BATTERY,
LECLANCHE BATTERY,
HILL BATTERY,



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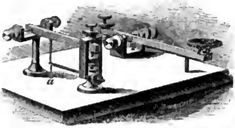

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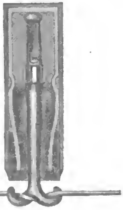

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Cables for River Crossings, Insulated Wires, Telegraph Wires, Iron Posts, Resistance Coils, Resistance Bridges, Universal Galvanometer, Differential Galvanometer, Conical Multiplicator, Reflecting Galvanometer, Sine Multiplier, Tangent Multiplier, and all the varieties of Electro-Metrical Apparatus manufactured by

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SUBMARINE TELEGRAPH CABLES,
INSULATED WIRES, for
TELEGRAPH AND ELECTRIC USE, and for
BLASTING AND MINING PURPOSES,
in every variety desired.

As an Insulation for Telegraph Cables and Electric Conductors Gutta Percha has been universally adopted by all scientific and practical Electricians and Manufacturers of Telegraph Cables and Wires in this country and Europe, and has sustained, with increasing confidence in its superiority, the practical test of over twenty years' general use.

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that he will guarantee to make and deliver at his Factory any style of Cable, Insulated with Gutta Percha, as low as they can IMPORT *Cable of the same style and quality.*

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JOURNAL OF THE TELEGRAPH.

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BRITISH SCIENTIFIC ASSOCIATION.

From the President's Address.

The origin of exact science in terrestrial magnetism is traceable to Gauss's invention of methods of finding the magnetic intensity in absolute measure. I have spoken of the great work done by the British Association in carrying out the application of this invention in all parts of the world. Gauss's colleague in the German Magnetic Union, Weber, extended the practice of absolute measurement to electric currents, the resistance of an electric conductor, and the electromotive force of a galvanic element. He showed the relation between electrostatic and electro-magnetic units for absolute measurement, and made the beautiful discovery that resistance, in absolute electro-magnetic measure, and the reciprocal of resistance, or, as we call it, "conducting power," in electrostatic measure, are each of them a velocity. He made an elaborate and difficult series of experiments to measure the velocity which is equal to the conducting power, in electrostatic measure, and at the same time to the resistance in electro-magnetic measure, in one and the same conductor. Maxwell, in making the first advance along a road of which Faraday was the pioneer, discovered that this velocity is physically related to the velocity of light, and that, on a certain hypothesis regarding the elastic medium concerned, it may be exactly equal to the velocity of light. Weber's measurement verifies approximately this equality, and stands in science *monumentum ære perennius*, celebrated as having suggested this most grand theory, and as having afforded the first quantitative test of the recondite properties of matter on which the relations between electricity and light depend. A re-measurement of Weber's critical velocity on a new plan by Maxwell himself, and the important correction of the velocity of light by Foucault's laboratory experiments, verified by astronomical observation, seem to show a still closer agreement. The most accurate possible determination of Weber's critical velocity is just now a primary object of the Association's Committee on Electric Measurement; and it is at present premature to speculate as to the closeness of the agreement between that velocity and the velocity of light. This leads me to remark how much science, even in its most lofty speculations, gains in return for benefits conferred by its application to promote the social and material welfare of man. Those who perilled and lost their money in the original Atlantic Telegraph were impelled and supported by a sense of the grandeur of their enterprise, and of the world-wide benefits which must flow from its success; they were at the same time not unmoved by the beauty of the scientific problem directly presented to them; but they little thought that it was to be immediately, through their work, that the scientific world was to be instructed in a long-neglected and discredited fundamental electric discovery of Faraday's, or that, again, when the assistance of the British Association was invoked to supply their electricians with methods for absolute measurement (which they found necessary to secure the best economical return for their expenditure, and to obviate and detect those faults in their electric material which had led to disaster), they were laying the foundation for accurate electric measurement in every scientific laboratory in the world, and initiating a train of investigation which now sends up branches into the loftiest regions and subtlest ether of natural philosophy. Long may the British Association continue a bond of union, and a medium for the interchange of good offices between science and the world!

The greatest achievement yet made in molecular theory of the properties of matter is the Kinetic theory of Gases, shadowed forth by Lucretius, definitely stated by Daniel Bernoulli, largely developed by Herapath, made a reality by Joule, and worked out to its present advanced state by Clausius and Maxwell. Joule, from his dynamical equivalent of heat, and his experiments upon the heat produced by the condensation of gas, was able to estimate the average velocity of the ultimate molecules or atoms composing it. His estimate for hydrogen was 6,225 feet per second at temperature 60 deg. F., and 6,085 feet per second at the freezing point. Clausius took fully into account the impacts of molecules on one another, and the kinetic energy of *relative* motions of the matter constituting an individual atom. He investigated the relation between their diameters, the number in a given space, and the mean length of path from impact to impact, and so gave the foundation for estimates of the absolute dimensions of atoms, to which I shall refer later. He explained the slowness of gaseous diffusion by the mutual impacts of the atoms, and laid a secure foundation for a complete theory of the diffusion of fluids, previously a most refractory enigma. The deeply penetrating genius of Maxwell brought in viscosity and thermal conductivity, and thus completed the dynamical explanation of all the known properties of gases, except their electric resistance and brittleness to electric force.

When the theory, of which we have the first instalment in Clausius and Maxwell's work, is complete, we are but brought face to face with a superlatively grand question, What is the inner mechanism of the atom?

In the answer to this question we must find the explanation not only of the atomic elasticity, by which the atom is a chronometric vibrator, according to Stoke's discovery, but of chemical affinity and of the differences of quality of different chemical elements, at present a mere mystery in science. Helmholtz's exquisite theory of vortex-motion in an incompressible frictionless liquid has been suggested as a finger-post, pointing a way which may possibly lead to a full understanding of the properties of atoms, carrying out the grand conception of Lucretius, who "admits no subtle ethers, no variety of elements with fiery, or watery, or light, or heavy principles; nor supposes light to be one thing, fire another, electricity a fluid, magnetism a vital principle, but treats all phenomena as mere properties or accidents of simple matter." This statement I take from an admirable paper on the atomic theory of Lucretius, which appeared in the *North British Review* for March, 1868, containing a most interesting and instructive summary of ancient and modern doctrine regarding atoms. Allow me to read from that article one other short passage finely describing the present aspect of atomic theory: "The existence of the chemical atom, already quite a complex little world, seems very probable; and the description of the Lucretian atom is wonderfully applicable to it. We are not wholly without hope that the real weight of each such atom may some day be known—not merely the relative weight of the several atoms, but the number in a given volume of any material; that the form and motion of the parts of each atom and the distances by which they are separated may be calculated; that the motions by which they produce heat, electricity, and light may be illustrated by exact geometrical diagrams; and that the fundamental properties of the intermediate and possibly constituent medium may be arrived at. Then the motion of planets and music of the spheres will be neglected for a while in admiration of the maze in which the tiny atoms run."

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GALVANIC EXPERIMENTS.

To the Editor of the Scientific American:

The interesting electrical experiment, described on page 203 of the *Scientific American*, reminds me of a series of galvanic experiments of a similar nature, which I made many years ago. As they have never been published, it may be useful to have them recorded in your widely read paper.

The house I occupied in Holland, in 1840, was situated a short distance from a river, to which, at high tide, the salt ocean water had access; but in which, at low tide, the fresh displaced the salt water. When the first mention was made about burying the plates of the galvanic battery in the earth, in order to procure a constant action, I conceived the idea of throwing a copper and a zinc plate into the river, each connected with a proper wire; and having conducted these wires to my house, and connected them with the galvanometer, a constant current was obtained which beautifully fluctuated in intensity, according to the degree of saltness of the water, but never became zero. When the copper plate was immersed in a fresh water well in the rear of the house, while the zinc plate remained in the sea water, so as to have a battery with two liquids and a porous cup (the earth) between, the current was almost as strong as when both plates were immersed in sea water, notwithstanding the plates were now several hundred feet apart; this proved practically, to me, that the earth offers little or no resistance to electric currents, a fact well established since the introduction of the electric telegraph.

The most curious variations of the experiment, however, was when immersing two copper plates of equal size—one in the fresh well water, and the other in the ocean water; at high tide there was a strong current, as the salt water acted on the copper; at low tide there was no current at all, as both plates were in equal circumstances in fresh water. The degree of saltness of the river water was beautifully indicated by the deflection of the galvanometer, going from zero, for fresh water at low tide, to the maximum at high tide: by slow changes in the surface of the plates, however (principally in that exposed to the action of the salt water), the maximums did not correspond every day, as was to be expected.

This experiment gave rise to a series of interesting and instructive investigations on a smaller scale, which I can highly recommend to all who want to become acquainted with the electric action of different liquids on metals, and also of liquids on one another. All that is wanted is a sensitive galvanometer, and some plates of different metals, of an inch high and two inches long, each soldered to a bent piece of thin copper wire, and sunk vertically in the liquids to be tested. The most practical way to insure perfect contact is to dip the ends of the galvanometer wire, in two separate cups with mercury, and to place these in such position, next to the trough containing the liquid, that when immersing the plates, the ends of the wires, soldered to the same, also dip in the mercury cups; in this way, a current is established at once, and if one plate is substituted for another, the difference of galvanic action is at once not only perceived but measured to a certain degree. The change of direction of the current, by changing one plate or the liquid, is also very interesting to observe, while it constitutes the simplest way to find out what acids or solutions may be available with different metals to make new galvanic batteries. So, for instance, I found in this way, now thirty years ago, that a solution of caustic soda or potash could be used between plates of zinc and copper in place of diluted sulphuric acid, while some ten or fifteen years ago, such a battery came in use among electro-platers.

I am, of course, aware of the more complete experiments, since made in this same direction, by eminent electricians; but as these results are recorded in such a way as to be only available for the scientific, and not for the practical men, I simply wish, by my remarks, to put our practical mechanics, of a scientific turn of mind, on such a tack as they, with their previous training, can explore with much better success than they would find in digging into the transactions of the learned societies found in our libraries, in which many important facts and valuable truths are, as it were, buried out of sight of those who are most interested in their knowledge, by reason of the practical results they could obtain from them. The investigation I recommend, is most assuredly a new field to many, and has the great merit of being economical, and thus within reach of all who would rather spend their money in experiments than in tobacco or rum.

The only slightly expensive piece of apparatus required in these experiments, is the galvanometer, if it has to be bought; but I will, in a future number, give the manner in which I constructed one, more than forty years ago—a very delicate instrument of this kind, which cost me almost nothing. I have used it ever since, and have it still in my possession. It reminds me of Berzelius, the great Swedish chemist, who states that, having lost the agate pestle of his mortar, he took an agate button from his coat, fixed it to a handle, and found it so convenient that he used nothing else for the rest of his life; and most practical men, no doubt, have found how often an improvised arrangement, made to serve a temporary purpose, is found to fulfill all the requirements of a permanently useful tool.

P. H. Vander Weyde, M. D.
New York city.

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THE ORIGIN OF LIFE.

Careful scrutiny has, in every case up to the present day, discovered life as antecedent to life. Dead matter cannot become living without coming under the influence of matter previously alive. This seems to me as sure a teaching of science as the law of gravitation. I utterly repudiate, as opposed to all philosophical uniformitarianism, the assumption of "different meteorological conditions"—that is to say, somewhat different vicissitudes of temperature, pressure, moisture, gaseous atmosphere—to produce or to permit that to take place by force or motion of dead matter alone, which is a direct contravention of what seems to us biological law. I am prepared for the answer, "Our code of biological law is an expression of our ignorance as well as of our knowledge." And I say "Yes; search for spontaneous generation out of inorganic materials; let any one not satisfied with the purely negative testimony of which we have now so much against it, throw himself into the inquiry." Such investigations as those of Pasteur, Pouchet, and Bastian are among the most interesting and momentous in the whole range of natural history, and their results, whether positive or negative, must richly reward the most careful and laborious experimenting. I confess to being deeply impressed by the evidence put before us by Professor Huxley, and I am ready to adopt, as an article of scientific faith, true through all space and through all time, that life proceeds from life, and from nothing but life.

How, then, did life originate on the earth? Tracing the physical history of the earth backwards, on strict dynamical principles, we are brought to a red hot melted globe on which no life could exist. Hence when the earth was first fit for life, there was no living thing on it. There were rocks solid and disintegrated, water, air all around, warmed and illuminated by a brilliant sun, ready to become a garden. Did grass and trees and flowers spring into existence, in all the fulness of ripe beauty, by a fiat of creative power? Or did vegetation, growing up from seed sown, spread and multiply over the whole earth? Science is bound, by the everlasting law of honor, to face fearlessly every problem which can fairly be presented to it. If a probable solution, consistent with the ordinary course of nature, can be found, we must not invoke an abnormal act of creative power. When a lava stream flows down the sides of Vesuvius or Etna it quickly cools and becomes solid; and after a few weeks or years it teems with vegetable and animal life, which for it originated by the transport of seed and ova and by the migration of individual living creatures. When a volcanic island springs up from the sea, and after a few years is found clothed with vegetation, we do not hesitate to assume that seed has been wafted to it through the air, or floated to it on rafts. Is it not possible, and if possible, is it not probable, that the beginning of vegetable life on the earth is to be similarly explained? Every year thousands, probably millions, of fragments of solid matter fall upon the earth—whence came these fragments? What is the previous history of any one of them? The hypothesis that life originated on this earth through moss-grown fragments from the ruins of another world may seem wild and visionary; all I maintain is that it is not unscientific.

From the earth stocked with such vegetation as it could receive meteorically, to the earth teeming with all the endless variety of plants and animals which now inhabit it, the step is prodigious; yet, according to the doctrine of continuity, most ably laid before the Association by a predecessor in this chair (Mr. Grove), all creatures now living on earth have proceeded by orderly evolution from some such origin. Darwin concludes his great work on "The Origin of Species" with the following words:—"It is interesting to contemplate an entangled bank clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependant on each other in so complex a manner, have all been produced by laws acting around us. * * * * * * There is grandeur in this view of life with its several powers, having been originally breathed by the Creator into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning, endless forms, most beautiful and most wonderful, have been and are being evolved." With the feeling expressed in these two sentences I must cordially sympathize. I feel profoundly convinced that the argument of design has been greatly too much lost sight of in recent zoological speculations. Reaction against the frivolities of teleology, such as are to be found, not rarely, in the notes of the learned commentators on Paley's "Natural Theology," has, I believe, had a temporary effect in turning attention from the solid and irrefragable argument so well put forward in that excellent old book. But overpoweringly strong proofs of intelligent and benevolent design lie all around us; and if ever perplexities, whether metaphysical or scientific, turn us away from them for a time, they come back upon us with irresistible force, showing to us, through nature, the influence of a free will, and teaching us that all living beings depend on one ever-acting Creator and Ruler.

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The question of the appropriation of the Electric Telegraph and its dedication to public use, has been definitely settled by the recent successes of foreign nations. It is now simply a problem of finance, and to whom can that be better submitted than to Massachusetts? She can speak authoritatively to her trusted representatives who now guard the public treasury with ever watchful eyes. She can point with exulting pride to the first organizer and intelligent chief of the Post Office in America, of whom was truthfully written that noble of modern Latinity, *Eripuit cœlo fulmen, sceptrumque tyrannis*, and demand that the mysterious agent which she in the person of her son subdued and plucked from the heavens, shall become henceforth a public servant and be guided by the scepter in the hands of the people.—*Speech of P. M. General in Boston.*

Grandly said, but the time has not yet come, and the question has more elements than finance.

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The successful extension of the telegraph line from Shanghai to Nagasaki places the world in communication with that advanced post in the Pacific, while it offers a renewed incentive to American constructors to complete the world-encircling girdle, and give us more direct communication by way of San Francisco. Almost simultaneously railroads have entered the Japanese Isles, and the people are gazing with wonder at the locomotive which travels over the three miles of line completed.

Material for a cable line between Nagasaki and Yokahoma has been ordered, and the line will be in working order within a year.

FAIR OF THE AMERICAN INSTITUTE.

ELECTRICITY.

Electricity, in one form or another, plays a prominent part at the exhibition this year.

RHUMKORFF'S INDUCTION COIL.

This wonderful instrument is exhibited by the Stevens Institute of Hoboken. Its length is 40 inches, height 18½ inches, and it weighs 166½ pounds. The primary wire is 200 feet long, while the secondary wire is 234,100 feet, or about 44⅓ miles. The battery employed to charge it consists of three glass jars, 10 inches diameter and 12 inches high, into which are lowered, by a windlass, fifteen plates of zinc and fifteen of carbon, each 6 × 9 inches. The exciting liquid is the usual mixture of bichromate of potash and sulphuric acid. With the above battery freshly charged and immersed 1 inch, the coil freely gives sparks 21 inches long in air, and white Leyden jar sparks 14 inches long; and the spark can be made to penetrate glass 3 inches thick. This performance has never been exceeded by an induction coil, and it is satisfactory to know that it was constructed by our countryman, Mr. E. S. Ritchie, of Boston. A few years since, the coil belonging to Columbia College, also made by Mr. Ritchie, was carried to Paris by Professor McCullough, and shown to Rhumkorff, who was so much astonished at its superiority over anything that he had ever constructed, that he begged permission to dissect it. This permission was granted, and he found that Ritchie's insulation and manner of winding the wires was superior to his own, and he adopted the American form.

It is generally admitted by physicists that Ritchie's contributions to our coils have been of great value, and that he has built several instruments superior to any of European manufacture. The performances of the monster coil are highly suggestive of a severe thunder storm, especially when the Leyden jar is filled and discharged in rapid succession. The effect of these discharges is to fill the air with the odor of ozone, and it is a question whether the instrument could not be used, as a convenient generator of this form of oxygen, on a sufficiently large scale to be employed as a bleaching agent in the arts.

BURGLAR ALARM.

There is the usual ringing of bells and perpetual din made by the opening and shutting of doors, to which the wires are attached, while the efficacy of this system of security against unwelcome visitors is set forth by the inventor or his agent. The plan of having the bells continue to ring until the connection is broken by some one in the house, is a capital one; and, if a bell on the street could be rung at the same time to attract the notice of the police, the rogues would be apt to vacate such premises as being too uncomfortable for quiet work.

ELECTRO-PROPULSION MOTOR.

This is the name given to an invention for working sewing machines by magnetism. To the end of a long lever are attached two iron armatures, and, by an ingenious pole-changer, the magnetic force is made to operate first on one side and then on the other; and, as the lever oscillates, it turns the crank of the wheel which is to do the work. The inventor uses four large cells of a Bunsen bichromate and carbon battery, to charge the magnets. The novelty of the adaptation consists in the manner of applying the pole changer, in the cup shape of the armature, and perhaps in the peculiar form of lever.

The circular which was handed to us says: "This apparatus can be applied for propelling sewing machines, as now on exhibition; also other machinery and street cars—as any power desired can be obtained by *magnates*." There is considerable truth in the latter part of the claim, as the magnates of our city can testify; as to the power of magnets to propel "street cars and other machinery," there appears to be some difficulty, as it has never been successfully accomplished. There is a small locomotive, driven by magnetism, in another part of the building, but this moves in such a weak, timid way, as to suggest a break-down the moment a load is attached to it.

Of the Electro-Propulsion Motor, the circular further says: "It dispenses with the use of the feet, which, in the opinion of the medical faculty, is so injurious." We agree with the medical faculty that it is injurious to dispense with the use of the feet, and are decidedly in favor of plenty of exercise. If it is true "that the apparatus can be *prefixed* to any kind of machine," we are likely to see much of it. It will be necessary, however, for the inventor to employ a more economical and convenient form of battery, before he can expect to induce many private individuals to try the new motor.

PHOTOGRAPHS OF MAGNETIC FORCE.

A beautiful application of photography to the illustration of physical phenomena is shown by Professor Mayer, of the Stevens Institute, who exhibits plates of the diagrams, formed by magnetic force, very much resembling the sound pictures, so long familiar to the students of philosophy.

Professor Rood made photographs of the electric spark in a manner somewhat similar to this, an account of which was published in Silliman's *Journal*. —*Report of the Scientific American.*

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LOCAL BATTERIES.

To the Editor of the Journal of the Telegraph:

In your last JOURNAL Mr. E. Dudley gives directions for the care of the Local Battery. Although he shows a practical knowledge in the care of Local Batteries, still he is deficient in a scientific knowledge required to give directions for the care of it. He says: "Take two good porous cells, entirely free from copper deposit; if any copper in them, it must be removed with sul. acid." Now, copper is never deposited on the inside of porous cups. Porous substances allow nothing to pass through them but liquids. Neither can the copper deposited on the outside of the porous cups be dissolved by sulphuric acid, and I doubt if he ever did it. Nitric acid is its solvent. Again, he says: "Never allow the liquid in the jars to rise as high as the liquid in the porous cups."

Why not? The liquids are put in the jars and porous cups to conduct the electricity from the copper to the zinc. If the porous cup is not used, the battery will act, but the zinc will soon get plated with copper, which will stop the action. Consequently, as the sulphate of zinc solution and the sulphate of copper solution must be in contact, a substance must be used which will be sufficiently porous enough to allow them to be so, but yet able to prevent the copper in the vitriol solution to reach the zinc. Yours respectfully, C. H. G.

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ELECTRIC SIGNALS IN MINES.

In Silesia and in Westphalia the use of electric signals in shafts is becoming very general; they are also very much employed in the basin of the Saar, where they are inseparable from mechanical hoists, etc. These electric apparatus have been applied, without modifications, to the *Graf-Beust* mines (Essen); their characteristic is that the voltaic circuit is closed by the earth. Along the circuit are interposed alarums and the manipulators, visible at every stage of the mine; the current is constantly closed; the alarums sound when the working of the manipulator interrupts the current; the pile is composed of twenty elements of brass-zinc plunged in a solution of sulphate of magnesia. At the mine of *Rhein Elbe*, the system for the transmission of signals is quite different; they are transmitted from the bottom upwards, and *vice versa*. In the transmission of signals from the bottom to the surface, a complete circuit is formed between these points. The manipulator is composed of a wooden fork, the teeth of which are covered in the interior with two sheets of copper in contact with the conducting wires; at the lower extremities of the sheets, there are two metallic pendants, which are brought into contact at the moment of interrupting the currents by closing the teeth of the fork, when the passage of the current sounds the bells placed at the surface. To transmit signals from the surface to the bottom, it is necessary, of course, to have a manipulator at the surface and bells at the bottom, but a single conductor only is required to be added, connecting the manipulator with the bells. The current is closed by the wire attached to the bells. The pile used at *Rhein Elbe* is composed of six elements of zinc charcoal plunged in a solution of mercuric sulphate, renewed every two months, for an extraction of from 400 to 450 tuns per day. The wires are protected by a wooden sheath. The erection in a shaft 220 yards deep has cost nearly £40; in which sum are comprised the expense of materials required for a year and two spare elements. Each additional yard would cost about 3s.; in a dry shaft the conducting wire can be covered simply with gutta-percha, in which case the expense would only come to about £24.—*Mechanics' Magazine.*

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CURIOSITIES OF LIFE.

Lay your finger on your pulse, and know that, at every stroke some immortal passes to his Maker; some fellow being crosses the river of death; and if we think of it we may well wonder that it should be so long before our turn comes.

Half of all who live die before seventeen.

Only one person in ten thousand lives to be one hundred years old, and but one in a hundred reaches sixty.

The married live longer than the single.

There is one soldier to every eight persons, and, out of every thousand born, only ninety-five weddings take place.

It you take a thousand persons who have reached seventy years, there are of

Clergymen, orators and public speakers	43
Farmers	40
Workmen	33
Soldiers	32
Lawyers	29
Professors	27
Doctors	24

These statements are very instructive. Farmers and workmen do not arrive to good old age as often as the clergymen and others who perform no manual labor; but this is owing to the neglect of the law of health, inattention to proper habits of life in eating, drinking, sleeping, dress, and the proper care of themselves after the work of the day is done. These farmers or workmen eat a heavy supper on a summer's day, and sit around the doors in their shirt-sleeves, and, in their tired condition and weakened circulation, are easily chilled, laying the foundation for diarrhœa, billious colic, lung fever or consumption.

SYRACUSE ASKS A QUESTION.

Syracuse, Nov. 6, 1871.

To the Editor of the Journal of the Telegraph :

A letter in the Journal of Nov. 1, dated Worcester, Oct. 19, signed E. W. Bradford, states that while the Massachusetts State Convention was in session in that city, "the total number of words of press report sent from Worcester office was ninety-seven thousand seven hundred and sixty-one."

I desire to inquire of Mr. Bradford, through the Journal, whether they did this amount of work with their regular force, or called on their neighbors to assist them.

I have been informed, from what seems to be a reliable source, that six of the most expert operators in Boston office were sent to Worcester to *help them out*, during the Convention.

During our late Convention we sent sixty thousand words of special reports with our regular force, using but three wires at any one time, and most of the time but two.

The question arises now, as to whether we were as badly beaten as our friend Bradford imagines.

Yours respectfully, Syracuse.

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RIGHTS OF MANAGERS.

To the Editor of the Journal of the Telegraph :

I am, at present, placed in an unpleasant position, of which the following is as correct a statement as I am able to give you: I am manager of a small office. A message is brought to the office to be sent to a newspaper. I read it over carefully. It contains no obscene or profane language, but speaks of a person living in this town in anything but a complimentary manner, yet mentioning no names. I read on. It has no signature. I request him to attach his signature to it, which he readily does, with the remark that he is a special reporter. The message is worth $12.00 to the Telegraph Company. I consequently shut my eyes to that portion which displeases me, and, as it violates no rules of the Company, I consider myself bound, as manager of the office, to send it with as much dispatch as possible. It, of course, comes out in print next morning. It looks spicy, but I can see nothing wherein I can censure myself for sending it, and consider that I have done my duty to my employers, and am satisfied. The papers duly reach the hands of my townsmen They read the heading, and satisfy themselves that it went by telegraph. They come to me and say I have no business to send such messages, and have laid myself liable to censure by any court. Some threaten to sue me for slander. I refuse to give them any satisfaction. As the truth of my sending it they ask me if I *would* send such a lie, if presented to me. I tell them *yes*; that when a message is presented to me, I have no right to know what it contains, providing it contains no obscene or profane language. I have no more right to the contents of such message than the mail-carrier has to the letters in his mail-bags. You are an old and esteemed officer of the Company, while I am, compared with you, but an infant. Under those circumstances I come to you for advice, and, judging from the much valuable information contained in your paper, I am sure I come not in vain, having never troubled you before. I trust you will find time to give me full information as to the right or wrong of this matter, and, begging that you will please answer in the next Journal, I remain, your obedient servant Anxiety.

Answer.—We believe that, in the case you name, you have done your whole duty. You cannot so direct and limit the rights of those who use the wires. The paper which publishes the scandal is open to the operation of the law by which scandal is punished. No pure community can be injured by such squibs. No good citizen gives them any attention. They simply tickle the palate of small people, and lower and degrade the paper which provides the provender.

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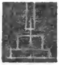
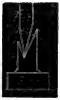
THE CONSTRUCTION OF OUR INSTRUMENTS.

To the Editor of the Journal of the Telegraph :

That's not a bad cut of my idea of a key which you published in your issue of a year ago. Let us proceed to the relay, which of late has been much improved. The same construction of the relay armature should be adopted as given for the key bar. Unless it be so, it will always happen that the iron bar of the armature will be nearer the magnet at one end than at the other. Even if they come from the shop without this objection, it is soon brought about by the tapping of the finger on one end of the iron bar to see if circuit is open, thus loosening it, or bending the screw which holds it to its place. The armature could be much lighter than I have yet seen any, and still be amply strong enough, if the metal used be properly shaped. It would be a capital thing if the armature could be secured otherwise than by pivot points, where there is generally much friction and binding. If a piece of watch spring could be inserted at each end of the horizontal bar, there would be an end of pivots and grinding. These pieces of watch spring would stand perpendicularly, the flat of them to be parallel with the iron bar. This arrangement would abolish the fine wire local connection, so often broken or loosely connected.



Side view of watch-spring bearing, instead of pivot-bearing.



Side view of point-bearing, instead of pivot-bearing, or watch-spring bearing.

But one of the greatest benefits has been attained by the double helix arrangement, which has not come into general use. I can give only one reason why it has not been adopted. All of them which I have seen had this objection, that the main and local wires were connected in the construction of the instrument. So that if any local battery worked through one of these relays had a ground connection, it was an injury to the main line, which could not be remedied without throwing out the instrument.

We have one in this office, and it is the best, for this reason, that it charges quicker than any other. I mean, that while any other relay of ours is working on a circuit where we do not get our own dots when adjusted for a remote office, this double helix relay will record every dot. We have tested this so often that there is no mistake about it.

I think it is Caton's invention—at any rate it is his make.

The reason why it charges quicker may be this: All the fine wire around the magnets is very near to the magnets, and none of it is over one quarter of an inch from them. This is not the case in other relays we use. In many of them more than two-thirds of all the fine wire is over a quarter of an inch from the magnet to be acted upon by the current.

Very respectfully, S.

MONEY ORDER OFFICES.

CORRECTIONS.

Newcastle, Pa., office is in E. P. Wright's district, instead of in C. O. Rowe's, as stated on List.

W. A. L'Hommedieu's headquarters are at Monroe, La., instead of at Shreveport, La.

Jefferson, Texas, office in L'Hommedieu's district, should be Jefferson. Texas.

◆

Plain Directions for the Construction and Erection of Lightning Rods. By John Phinn, C. E. New York. Handicraft Publication Co. Price 25 cents.

This is a simple and practical little work, intended to convey just such information as will enable every property owner to decide whether or not his buildings are thoroughly protected. It is not written in the interest of any patent or particular artitle of manufacture, and, by following its directions, any ordinary skillful mechanic can put up a rod that will afford perfect protection, and that will not infringe any patent. Every owner of a house or barn ought to procure a copy.

◆

The Santa Fe *Post*, of October 23, says: "The telegraph operator at Cimarron yesterday found the line cut and about fifty feet of wire gone at Red River. Not having enough wire with him to repair the break, he caught a squaw, took the wire from her hoop-skirt, and, with the addition of the wire off an old broom handle, managed to repair the line so that a few dispatches were got through."

◆

Millions of dollars have been expended in the oil region in the purchase of territory and the sinking of wells without striking oil, to the loss, disappointment, and chagrin of all concerned. Although a decade has passed since petroleum was discovered, still the speculation of the wisest is at fault as to the boundaries of the deposit, or the course of the oil belt. Surface indications, once the popular guides, are no longer regarded as infallible criteria; but if the experience of the practical operator is at fault in locating wells, it must also be confessed that science has as yet failed to shed any ray of light which will regulate or determine the place of profitable development.

The possibility of passing electric currents through the earth has long been an admitted fact, and is daily demonstrated in the use of the electric telegraph. If two metallic plates, such as zinc and copper, are sunk in the ground, several thousand feet apart, and the plates are connected together with a wire running over the surface of the earth, and one of the plates is acted on by a known strength of acid, an electrical action will be set up of greater or less intensity, depending, partly, upon the media through which the return current has to pass, and, also, upon the distance apart at which the plates are stationed. The most feeble current is readily detected by a delicate galvanometer. If there be a large body of some non-conducting substance in the earth, between the two plates, the galvanometer will determine the extent of this obstruction by its feeble fluctuation. This being a known fact, its application to ascertaining the location of large bodies of petroleum, which is a very poor conductor of electricity, at once becomes apparent. But how may it be practically applied? It is proposed to sink a zinc plate in the bottom of some particular well, and copper plates in the wells of surrounding localities, at distances as nearly equal from the zinc plate as possible. The galvanometer will be acted on, to a greater or less degree, by the greater or less bulk of oil lying between the zinc and copper, which will be a very clear indication of the direction in which it is situated.—*Titusville Herald.*

THE SERVICE.

WESTERN UNION TELEGRAPH COMPANY.

EASTERN DIVISION.

APPOINTMENTS—SEPTEMBER, 1871.

[*Compiled by E. Cockey, Esq. Gen. Sup.t's Office, N. Y.*]

Miss Ella Aldrich	operator	145 Broadway, New York.
J. Byrne	clerk	145 Broadway, "
Miss S. E. Cornwall	operator	134 Pearl st., "
J. J. Eckstein	clerk	145 Broadway, "
R. C. Edwards	operator	145 Broadway, "
F. W. Golden	"	Stock Exchange, "
W. H. Groff	"	87 Worth st., "
Geo. F. Lane	"	104 Vesey st., "
Miss R. E. Marshall	"	145 Broadway, "
R. M. Mattocks	"	4 Hanover st., "
J. J. McKeever	"	145 Broadway, "
J. A. Macdonald	"	145 Broadway, "
R. A. Myers	"	145 Broadway, "
J. F. Moore	"	145 Broadway, "
M. H. Redding	manager	Stock Exchange, "
F. M. Shefers	operator	Stock Exchange, "
Miss Clara V. Utley	"	145 Broadway, "
D. F. Vaughan	clerk	145 Broadway, "
C. H. Fowler	operator	Canterbury, N. S.
G. W. Sawyer	"	Waterville, Me.
A. W. Todd	"	Portland, Me.
S. B. Reynolds	"	Pembroke, Me.
—— Morse	"	Centre Harbor, Me.
E. B. Chase	"	Maynard, Mass.
A. W. Rice	"	Stoneham, "
Miss A. F. Whitmarsh	"	Charlestown, Mass.
Miss M. J. Lewis	"	Westbrook, Conn.
E. H. Corey	"	Tremont House, Boston.
E. M. Fox	"	Main Office, "
G. H. Prescott	"	Post Office, "
F. W. P. Learned	clerk	Main Office, "
W. T. Stone	operator	Albany, N. Y.
N. S. B. Gates	bookkeeper	" "
O. Wakeman	operator	Chappaqua, N. Y.
A. J. Mulligan	"	Charlotte, "
A. S. Howe	"	Utica, "
W. E. Spedden	"	Baltimore, Md.
R. H. Smith	"	" "
R. O. Crowley	"	" "
H. J. Menslage	clerk	" "
C. J. Kirschner	operator	Cockeysville, Md.
J. G. Boyce	"	Gloucester City, N. J.
Rebecca E. Marshall	"	Hoboken, N. J.
E. A. Teupser	"	Harrisburg, Pa.
J. F. Hibbard	"	Lack. & Bloom. Junc., Pa.
W. Munson	"	Madison, N. J.
E. C. Adams	"	Mauch Chunk, Pa.
I. S. Mills	"	Newark, N. J.
W. Smith	"	Phillipsburg, N. J.
B. F. Van Winkle	"	Perth Amboy, N. J.
M. R. Browne	"	Philadelphia, Pa.
J. Graff	"	" "
O. A. Clewell	"	So. Bethlehem, Pa.
J. O. James	"	Trenton, N. J.
C. Numbers	"	Wilmington, Del.
*H. Willian	"	Bustleton, Pa.
*J. J. G. Riley	cashier, &c.	Baltimore, Md.
*R. D. Riley	operator	" "
*W. E. Vernetson	"	" "
*H. Gentry	"	" "
*—— Crummer	"	" "
*P. O. Hess	"	" "
*N. K. Mulford	"	Madison, N. J.
*E. H. Smith	"	Newtown, Pa.
*T. H. C. Reed	"	Darlington, Md.
*G. S. Mott	"	Philadelphia, Pa.
*E. A. Scott	"	" "
*W. H. Pusey	"	" "
*R. J. Wynne	"	" "
*M. D. Buckwell	"	" "
*J. T. Maxwell	"	" "
*E. C. Bernard	clerk	" "
*F. E. Vandersloot	operator	" "
*M. F. Connor	"	" "
*J. W. Dyer	superint'nt.	" "
*C. E. Stamp	clerk	" "
*J. J. C. Daughters	"	" "
*J. W. Carver	operator	Somerville, N. J.
*J. D. Cameron	"	West Chester, Pa.
*J. H. Smith	"	Yardleville, Pa.
*W. H. Young	manager	Washington, D. C.
*J. F. Hahn	operator	" "
*—— Ryan	"	" "
*J. Saffell	clerk	" "
*J. M. Gassoway	operator	" "
*C. Klotz	"	" "

*Formerly employed by Bankers and Brokers' Telegraph Co.

D. H. Day	messenger	Paterson, N. J.
Mrs. R. W. Robbins	operator	Oban, N. Y.
W. C. Morgan	"	Burning Springs, W. Va.
G. R. Marquette	"	Point of Rocks, Md.
J. E. Brent	clerk	Parkersburg, W. Va.
H. Hastings	operator	" "
M. O. Sellich	"	Sir John's Run, Md.

RESIGNATIONS.

G. Cook	operator	145 Broadway, New York.
R. R. Manners	operator	145 Broadway, New York.
Miss R. E. Marshall	operator	145 Broadway, New York.
Mrs. C. A. Morris	operator	134 Pearl street, New York
Miss M. L. Read	operator	145 Broadway, New York.
J. A. Burkholder	operator	145 Broadway, New York.
H. E. Grant	operator	145 Broadway, New York
P. J. McKeever	operator	145 Broadway, New York.
A. F. Thurber	operator	145 Broadway, New York
E. H. Jordan	operator	Waterville, Me.
W. McLaughlin	operator	Pembroke, "
C. H. Dearborn	operator	Centre Harbor, N. H.
W. N. Sperry	operator	Bridgeport, Conn.
F. Doutney	operator	Atlantic House, Newport.
A. Dann	operator	Tiverton, R. I.
Miss M. O. Harlow	operator	Watch Hill, "
C. Sughrue	operator	Boston, Mass.
J. A. Macdonald	operator	Albany, N. Y.
W. T. Stone	operator	" "
G. W. Mason	clerk	" "
M. G. Chipman	operator	Lebanon Springs, N. Y.
E. Reynolds	operator	Philmont, "
E. S. Swift	operator	Charlotte, "
G. Hurd	operator	Niagara Falls, "
J. R. Moore	operator	Trenton Falls, "
W. H. Parsons	operator	Utica, "
J. F. Anderson	operator	Allentown, Pa.
W. S. Gray	operator	Ashland, Pa.
J. B. F. Shock	operator	Baltimore, Pa.
T. E. Maddox	operator	Baltimore, Pa.
F. Bradnack	operator	Cape May, N. J.
H. A. Hawkins	operator	Gloucester, N. J.
S. M. Field	operator	Lack. & Bloom. Junc., Pa.
W. Grasby	operator	Madison, N. J.
C. R. Eberle	operator	Mauch Chunk, Pa.
W. Williams	operator	Newark, N. J.
J. E. O'Brien	operator	Phillipsburg, "
J. A. Ellegood	operator	Perth Amboy, "
J. B. Coulter	operator	Philadelphia, Pa.
D. A. Carl	operator	" "
R. A. Myers	operator	" "
J. McDermott	operator	" "
J. Moffatt	operator	Scranton, "
A. C. Barker	operator	Washington, D. C.
J. Holly	operator	" "
G. S. Mott	operator	Philadelphia, Pa.
E. A. Scott	operator	" "
R. J. Wynne	operator	" "
M. F. Connor	operator	" "
C. E. Stamp	operator	" "
J. L. Baker	operator	Oakland, Md.
J. Cunningham	operator	Parkersburg, W. Va.
R. Furtney	operator	Sir John's Run, Va.

TRANSFERRED.

W. A. Harris	Hartford, Conn., to Bridgeport, Conn.
E. J. Fullam	Boston, Mass., to Duxbury, Mass.
A. S. Bodwin	Boston, Mass., to Duxbury, Mass.
Miss S. E. Long	Charlestown, Mass., to Boston, Mass.
Geo. N. Thomas	Newport, R. I., to Gold Board, Boston, Mass.
Z. Gibbs	Tremont House, Boston, to American House, Boston, Mass.
M. Devin	Gold Board, Boston, to Main Office, Boston, Mass.
C. H. Ormsby	Post Office, Boston, to Main Office, Boston, Mass.
J. Randall	American House, Boston, to Main Office, Boston, Mass.
H. J. Kings	Chappaqua, N. Y., to Philmont, N. Y.
J. W. Gay	Lake Mahopac, N. Y., to Brewsters, N. Y.
R. R. Bates	Atlantic City, N. J., to Washington, D. C.
H. A. Wells	Cape May, N. J., to Philadelphia, Pa.
E. P. Adams	Cape May, N. J., to Mauch Chunk, Pa.
C. L. Laverty	Harrisburg, Pa., to Philadelphia, Pa.
T. Williams	Newark, N. J., to New York, N. Y.
E. A. Teupser	Scranton, Pa., to Harrisburg, Pa.
F. W. Tunnell	Trenton, N. J., to Ashland, Pa.
J. H. Simpson	Wilkesbarre, Pa., to Allentown, Pa.

PLAINFIELD, Ind., Nov. 2, 1871.

To the Editor of the Journal of the Telegraph :

Having noticed your kindness in answering questions that are asked by those interested in the telegraph and its interests, I conclude to ask a few, leaving you at your option in regard to answering them. I have not been long in the telegraphic fraternity, yet feel a deep interest in its further success and usefulness, and am heartily glad to see such evidence of its elevated morality as appears by your most excellent paper. The JOURNAL is an instrument of much good, and I would be willing to do my part in increasing its usefulness, if I felt that you needed such help as mine.

There is a State institution about one and a half miles from the office in which I act as operator, manager and delivery messenger, and it often occurs that messages arrive here and cannot at once be sent to the institution, which, you know, often impairs the usefulness of the telegraph. The superintendent of this institution and myself propose to put up a private line between the two points, and we wish to ask (A), will it be necessary to get a charter, in order to put up such a line? It will probably run along the public street of the village, and beside the gravel road, to the farm of the institution. Village is not incorporated. (B) What kind of battery and instruments would you recommend? Would those made by the Nonpareil Telegraph Company, advertised in your paper, be suitable? (C) What kind of wire would be best for main line? (D) What would be the probable cost of such line, one and a half miles, exclusive of poles and putting up? (E) Would ordinary bottle necks be suitable insulators?

Here, Mr. Reid, is quite an array of questions which you will very much oblige us by answering, but if you have not the space or time to do so, we will take no offence. Yours, very truly,

C. GREEN.

We are glad to answer all enquiries made of us so far as we have knowledge. The present seems a simple case, and requires only a brief reply.

For a line built for local convenience it seems to us that the parties owning the intermediate land, or the village authorities, would gladly give right to plant the necessary poles, which need not exceed 30 in all. There must be Road Commissioners, who can give such rights, and, if not, owners of property would, no doubt, grant permission inside their fences. Almost all such lines are built in this way.

The wire used need not exceed No. 10 plain iron wire, costing say forty dollars, or galvanized wire for fifty.

For two persons, understanding the Morse alphabet, and capable of conversing together by sound, Pope's Nonpareil apparatus, with battery adapted to the length of the line, will be the most economical and suitable.

Thirty glass insulators of the ordinary kind, costing three dollars, and brackets three more, would be suitable for such a line. The rubber and Brooks insulators are more permanent, and, therefore, cheaper. What is meant by bottle necks we do not clearly understand.

The whole cost, outside of the cost of poles and labor, will not exceed $85, exclusive of office furniture, if the Nonparell apparatus is used.

PRICES.

30 glass insulators and brackets	$ 6 00
30 rubber insulators and blocks	9 00
30 Brooks insulators, complete	9 00
1½ miles No. 10 plain wire	36 00
1½ miles No. 10 galvanized wire	45 00
Freight, say	10 00
Double set Nonpareil apparatus, with battery to suit	18 00

Journal of the Telegraph.

This Journal is issued on the 1st and 16th of each month. Its circulation is 6,500. It goes to every State, Territory, and Province on the continent. It is fast becoming a necessity, and is already welcomed as a friend. No better medium for advertising exists.

TERMS:

ONE DOLLAR PER ANNUM IN ADVANCE.

FOUR DOLLARS FOR FIVE COPIES.

Address—
JAMES D. REID, Editor,
Executive Rooms, Western Union Tel. Co.,
145 Broadway, New York.

NEW YORK, NOVEMBER 15, 1871.

CLOSE OF VOLUME IV.

Everything comes to an end and nothing more rapidly than the years. It seems but a day or two since we sat down in the chair editorial, timidly canvassing our powers, and troubled to know how to begin. We retain much of the same shrinking now, as we close the records of another year. To have a clearly defined purpose, a truth waiting expression, a tribute demanding utterance, a censure claiming delicate statement, a prophecy of the coming years broadening in its radiance—these are not always present to the mind, and are often found, like fish to unskilled fishermen, after long watching. Yet it is wonderful how many of these come. The Telegraph work already seems an old story. Its romance seems gone. It seems now a dull question of work, or speculation, or destiny. Men discuss the propriety of its private management, others the necessity of its public control. Even these are old stories. And yet the Telegraph and its work are full of the Nation's blood and life. It causes ceaseless ripples wherever the click of the magnet is heard. There is still no more sacred trust on this wide earth than its management. It is a machine, indeed, and, after its fashion, runs like other machines. But it has more of heart and soul and brain in it, touches more closely, probes more nearly, arouses more vividly the springs and motives of all human action. It is a machine, but has a soul in it. The secrets of the wide world, of its affections and hates, its meanness and charities, the schemes of men and the plots of nations, all throb along the wires day and night from Japan westward to the Golden Gate. It has no sleep now. The lights never go out. It has not even a Sabbath, except in the diminished work which the grateful rest and its devout recognition causes and confirms. The sleep of its operators is a soldier's dream. The bugle that calls to toil is ever near the bugler's lips.

So must there ever be much to stimulate thought, to arouse inquiry, to lay anxious plans for the wider and freer and more beneficent use of the telegraph. True, telegraphic management has become, of necessity, now, a question of economies, of the simpler and more efficient application of known forces, of the arrangement of labor, of statistics and the utilization of the facts derived therefrom, of the reduction of the sources of useless toil in all its departments. Yet with all this comes a humanizing and grateful thought of the telegraph as the bond of the world's fellowship, and the silent minister of the coming regnance of its peace. High above the question of economies, there stirs in every right-thinking mind the idea and value and sacredness of a power so resemblant of the Divine.

In one thing we rejoice. As we bid the six or seven thousand eyes, whom we look into for the last time as the year closes, we discern a higher status of intelligence and heart. The national erection of the statue which stands to-day in the keen November air of Central Park, will ever be eloquent of a generosity and enthusiasm which could not have been possible among dead-hearted men. The world has never seen a tribute paid in itself so just, and in its provision so universal. The Morse statue is a memorial little less of the craft than of the venerable inventor. Future years will so regard it. So of the spontaniety with which the craft everywhere has sprung to the relief of suffering. Chicago tells its story. Its insurance society is a thing of the affection of civilization. Blessed be the men and women who have entered into the charities of the departed year.

As we bid you, therefore, good-night, it is only to meet, brighter and fairer, and with quickened desires for usefulness, in the morning. Some of the sisterhood, we know, would like to pay that debt which we paid for them before we close the door of the year. But the debt will keep. We are patient. Au revoir.

◆

THE TARIFF BUREAU.

There is no department of the Telegraph service so difficult of management, so prolific of perplexity and labor, as that in which the tariff arrangements of a great company are managed and directed. This is especially so when, after having carefully established a minimum tariff, based upon the lowest product compatible with proper remuneration, special charges have to be made to meet rates made lower than a fair profit would warrant by lines started in opposition, to whom reduced rates is a necessity as an advertisement. Recently, circumstances have brought us into contact with this department more than usual, and we cannot avoid bearing testimony to the patience, perseverance and method with which it is carried on. So simple have the tables comprising eight millions of the regular tariffs been arranged, that a question respecting the rate of any telegraph station on the continent to any other, can be promptly answered by a boy who has only been a few weeks connected with the office. The gentleman in charge of this department is Mr. William Holmes, who, with his assistant, Mr. Charles Schuster, and Mr. R. G. Page, perform its entire labors, and who deserve the utmost credit for the fidelity and industry which, without designing flattery, is so characteristic of this toilsome branch of the service.

At present a vigorous examination has been ordered by President Orton, to prove the possibility of adopting uniform rates between States, so that one rate will answer for every office in one State to every office in another. This has required a vast amount of labor, and has brought out a talent for classification and felicitous exposition, which leaves the proof clear and striking, and renders the final executive work one of simple decision. Thus the present rates of two States are given, with their cash product and profit therefrom, the tariff found from which the maximum receipts are derived, and from these the basis of a general tariff approximating this central rate, as the rates above and below it may indicate, found. To do this, we need not say, immense labor has been necessary. The result is, that the probability now is that a system of charging between States will soon be inaugurated on as low a tariff as seems consistent with the facilities of transmission and a prudent care of the interests of stockholders.

In regard to this inter-State tariff we copy from an interesting report of Mr. Holmes to the President the closing paragraph:

"Should the rates suggested be adopted, there seems no reason why they cannot be put into almost immediate effect. A circular to each office, giving the rate from one State to another, would be all that would be necessary, and I would respectfully urge the abrogation of all others."

We have only to say further, that when the good day comes when the rates throughout this great land are reduced to the number of States with a single tariff for each, it will be the cause of much rejoicing to many wearied men to whom watching tariff rates is a constant toil, and blessed will be he who orders or aids it.

◆

Is Italy the loss of the Postal Telegraph system in seven

years is stated as	Fr. 1,810,287
Value of lines	8,000,000
Number of instruments	1,116
Telegrams sent, received and reproduced	8,427,442
Length of lines in miles	9,927
Proportion on railroads	2,173

◆

Cyrus W. Field, Esq., sails for Europe, on the Scotia November 29, to attend the conference in Rome of the representatives of the Governments which have signed the Telegraphic Convention of Vienna, 1868, which convenes December 1, next.

◆

Sir James Anderson is engaged on the preparation of a paper, which he may issue in pamphlet form, showing the progress of telegraphy in the world, its comparison with population, area of country, nationality, and trade. Among its details will be the length and cost of wires and maintenance. This paper will embrace American statistics, and respecting which he is now endeavoring to obtain information.

◆

HOW THEY RISE!

A year or two ago, our friend S. J. Smith, Jr., left the Auditor's Office, Western Union Telegraph Company, New York, to try his fortune in Kansas. He soon established himself in business at Elk City. When we last saw him, we prophecied he would be its first Mayor. But here is a higher honor. He is up for the Legislature. His name is before us, accompanied by a handsome eulogy of him as a man "of whom any constituency might well be proud." Of course. We are proud of him. We second the motion. We declare it carried. Who says Mr. Smith will not be elected?

CABLE BLANKS.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
145 Broadway, New York,
November 3, 1871.

Executive Order No. 131.

All messages offered for transmission over the Atlantic and Cuba cables should be written on cable blanks. This rule must be enforced invariably where offices are supplied with cable blanks. If, for any reason, they have none on hand, such messages may be written on No. 2 blanks, but, in this case, managers must call the attention of the customer specially to the clause in the printed heading of the No. 2 blanks, making this Company the agent of the sender, without liability, to forward any message over the lines to any other Company, when necessary to reach its destination, and they must require the customer's assent thereto. WM. ORTON, President.

◆

Answers to Correspondents has been crowded out with other matter which will duly appear.

◆

SALE OF THE ATLANTIC TELEGRAPH CABLE.

Information has reached us from a source entitled to credit, that the British Government has been negotiating, and has nearly concluded the negotiation, for the purchase of the Atlantic Telegraph cable. The story is confirmed by the well-known fact that a ring or syndicate of London capitalists has lately paid $25,000 for the privilege of purchasing within ninety days, and at ninety cents on the dollar, $2,500,000 of the stock of the New York and Newfoundland Company, the wires of which form the exclusive connection between the western end of the Atlantic cable and the telegraph system of the United States.—*N. Y. Sun.*

Answer.

1. The British Government have commenced no such negotiations of which the Company have any knowledge.

2. No ring or syndicate of London capitalists have paid a dollar for the privilege named. A proposition has been made to purchase the property of the New York, Newfoundland and London Telegraph Co. but it has not been entertained, and no contract has been closed respecting its acquisition.

◆

MORE MONEY FOR CHICAGO.

To the Editor of the Journal of the Telegraph:

Dear Sir: In smacking your lips over "*that kiss,*" and the many other good things with which your sanctum is enlivened, please do not forget to make a note that Washington office contributed towards the alleviation of the sufferings of its unfortunate Chicago friends by a remittance of $88, to care of Superintendent J. J. S. Wilson, in whose judgment and integrity we rely for a fair application of the relief. Very truly yours,

CHAS. A. TINKER.

Just like Washington to do. Give us your hand. Who sys all men ain't brothers?

◆

WESTERN UNION TELEGRAPH COMPANY,
NEW YORK, November 3, 1871.

J. D. REID, ESQ.,

My Dear Sir: I have had the pleasure to receive, through you, a photographic copy of the Testimonial of the Telegraphers of the World to Prof. S. F. B. Morse, the orginal of which has been prepared by the D. T. Ames Engrossing Company. The artist by whom it was designed has acquitted himself with great credit, and produced a work of especial interest to the telegraphic fraternity, and to all the friends of Prof. Morse who contributed to the erection of the statue in the Central Park. Will you do me the favor to convey my thanks to the officer of the Company to whose courtesy I am indebted for this interesting picture, and oblige Yours very truly,

WM. ORTON.

The cost of these monographs is $1.25.

THE HOLIDAYS.

Executive Order No. 132.

On Thursday, the 30th inst., on Monday, Dec. 25, and on Monday, Jan. 1, 1872, office hours will be from 8 to 10 o'clock, A. M., and from 4 to 6 o'clock, P. M., except at repeating stations and principal offices, which will be kept open as usual, but with such reduction of force on duty as circumstances may permit. WILLIAM ORTON,

Prest.

◆

THROUGH TO MEXICO.

The line to Brownsville, Texas, on the Rio Grande, is reported complete, and that office open for business. We hope soon to chronicle direct connection with the halls of the Montezumas.

◆

THE CHICAGO FUND.

Mr. Baker, of the Operators' Relief Fund, Chicago, acknowledges receipt of $1,800 from different quarters. Twenty-five telegraphers were burned out, and have been comfortably provided for. A detailed acknowledgment will soon be made.

Mr. Springstead, Cosmopolitan Hotel, N. Y.,	$5

◆

WE return our thanks to Pof. G. W. Hough, Director of the Dudley Observatory for Vol. 2, Annals of the Dudley Observatory. It is a handsome duodecimo volume of 400 pages containing copious descriptions of the mechanism of the automatic registering barometer and anemographs by which meteorological phenomena is obtained and kept. We have only time to make this hasty allusion to this valuable contribution to our Meteorological literature but will have occasion hereafter to refer to it.

◆

WE are sorry to learn of the death of Christopher Reynolds, formerly operator at 145 Broadway, N. Y., but who for over a year past has been struggling with the disease which has now mastered him. He was a man much beloved by his associates, and within the last few weeks a purse of $140 was made up by his friends in New York and Buffalo for the relief of his destitute family. He died in utter poverty. He was a member of the Telegraphers' Mutual Insurance Association. He died Monday, November 6, at 7:10 P. M., and was buried in Goshen, N. Y., on Thursday, Nov. 9, at noon.

◆

INFORMATION WANTED.

Any information of my son Joe Stephenson will be thankfully received by his father. He is a telegraph operator—about 22 years old. Last I heard from him was in June or July. He was an operator on the line of the I. B. & W. R. R., near Indianapolis, Ind. Address,

JOHN STEPHENSON, Urbana, Ill.

◆

TARIFF BUREAU.

SEMI-MONTHLY CIRCULAR.

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY.
145 Broadway, New York,
November 16, 1871

To all Offices on W. U. Lines:

The following changes in tariff have occurred since Nov. 1st, the date of the last tariff order.

Managers are hereby required to enter these changes in their tariff book as soon after the receipt of the JOURNAL *as possible.*

NEW OFFICES.

456 Beverly, Platt Co., Mo.
363 Brandon, Miss., re-open'd.
170 Bowerstown, O.
• Brewerton, N. Y.
243 Bagdad, Ky., re-opened.
• Bullionville, Nev.
319 Carmi, Ill. Heretofore an other line office.
201 Centerton, O.
• Centerville, Orange Co., N. Y.
323 Coatopa, Ala.
Colorado Springs, Col.—Tariff same as Colorado City.
• Deckertown, N. J.
121 Dawson, Pa.
6 Elwood, Ks.
310 Equality, Ill.
319 Enfield, Ill. Heretofore an other line office.
• Fairmount, Neb.
• Franklin, N. J.
• Gilsonburgh, Pa.
• Grafton, Neb.
• Hamburgh, N. J.
441 Lenexa, Ks.
300 Mt. Vernon, Ind. Heretofore an other line office.
319 McLeansboro, Ill.
Mineral Hill, Nev. Tariff same as Eureka, Nev.
494 McDade, Texas.
• New Foundland, N. J.
270 Osceola, Ind.
47 Old Bridge, N. J. Check Bordentown, N. J.
• Pioche, Nev.
• Peckville, Pa.
467 Parker, Ks.
• Parish, N. Y.
21 Readville, Mass.
• Richmond Falls, W. Va.
• Roxbury, N. Y.
310 Shawneetown, Ill. Heretofore an other line office.
• Springfield, Dac.
263 Simpsonville, Ky., re-op'nd.
319 Wabash, Ill.
29 Westbrook, Conn., re-op'n
351 Waterford, Miss.
• Wortendyke, N. J.
• White Sulphur, W. Va.

NEW OFFICES ON OTHER LINES.

	Tariff for Other Lines.		*Leaves this Line.*
Bullionville, Nev.	200	20	Salt Lake City, Utah.
Brewerton, N. Y.	25	2	Syracuse, N. Y.
Centerville, Orange Co. N. Y.	25	2	Middletown, N. Y.
	35	3	Godwinville, N. J.
Deckertown, N. J.	25	2	Middletown, N. Y.
	20	2	Godwinville, N. J.
Fairmount, Neb.	110	7	Plattsmouth, Neb.
Franklin, N. J.	25	2	Middletown, N. Y.
	20	2	Godwinville, N. J.
Gilsonburgh, Pa.	20	2	Honesdale, Pa.
Grafton, Neb.	120	8	Plattsmouth, Neb.
Hamburgh, N. J.	25	2	Middletown, N. Y.
	20	2	Godwinville, N. J.
New Foundland, N. J.	25	2	Middletown, N. Y.
	20	2	Godwinville, N. J.
Parish, N. Y.	20	2	Syracuse, N. Y.
Peckville, Pa.	20	2	Honesdale, Pa.
Pioche, Nev.	200	20	Salt Lake City, Utah.
Roxbury, N. Y.	45	3	Rondout, N. Y.
Richmond Falls, W. Va.	75	5	Catlettsburg, Ky.
Springfield, Dac.	125	10	Sioux City, Iowa.
Wortendyke, N. J.	25	2	Middletown, N. Y.
	20	2	Godwinville, N. J.
White Sulphur, W. Va.	90	6	Catlettsburg, Ky.

OFFICES CLOSED.

Auburn, Ala.; Colorado City, Col.; Dunreith, Ind.; Feurabush, N. Y.; Somer's Point, N. J.; 120 Summit, Chautauque Co., N. Y.; Scribner, Neb., and Pocahontas, Tenn.

GENERAL INFORMATION.

The following changes in "Tariff for Other Lines" have been authorized.

	Tariff for Other Lines.		*Leaves this Line.*
Barboursville, W. Va.,	35	3	Catlettsburg, Ky.
Big Bend Tunnell, W. Va.,	80	6	Catlettsburg, Ky.
Charleston, Kenawha Co.,	45	4	Catlettsburg, Ky.
Coalsmouth, W. Va.,	40	3	Catlettsburg, Ky.
Huntington, W. Va.,	30	3	Catlettsburg, Ky.
Miller's Ferry, W. Va.,	60	4	Catlettsburg, Ky.
Stretcher's Neck, W. Va.,	70	5	Catlettsburg, Ky.
Elk Point, Dac.,	35	3	Sioux City, Iowa.
Waverly, Neb.,	50	3	Plattsmouth, Neb.
Crete, Neb.,	75	5	Plattsmouth, Neb.
Dorchester, Neb.,	85	6	Plattsmouth, Neb.
Pompton, N. J.,	25	2	Middletown, N. Y.
	20	2	Godwinville, N. J.
Bloomingdale, N. J.,	25	2	Middletown, N. Y.
	20	2	Godwinville, N. J.
Bloomingburgh, N. Y.,	25	2	Middletown, N. Y.
	30	2	Godwinville, N. J.
Fallsburg, N. Y.,	25	2	Middletown, N. Y.
	35	3	Godwinville, N. J.
Monticello, N. Y.,	25	2	Middletown, N. Y.
	35	3	Godwinville, N. J.
Central Square, N. Y.,	25	2	Syracuse, N. Y.

The name of the office heretofore known as Roxbury, Mass., has been changed to Boston Highlands, Mass.; that of Ainsworth, Ill., changed to South Chicago, Ill., and Framingham, Mass., to South Framingham, Mass. Delivery charges for Framingham, 15c. by train, or 75c. by special messenger.

Liverpool, N. Y., is now an "Other Line Office," tariff 25 and 2 from Syracuse, N. Y.

Messages for Charlestown Navy Yard, Mass., should be sent and checked to Charlestown, Mass.

OFFICES HAVING "SPECIAL SHEET A,"

Will check Summit Hill, Pa., 25 cents more than "special rate" to Mauch Chunk, Pa.

ATLANTIC CABLE BUSINESS.

The ten word rate to Shanghae and Nagasaki is abolished. The minimum rate is now the rate for twenty words.

The special rate for messages to the Papal States is now abolished, and the Italian rate substituted, viz.: $1.88 by the ordinary route, and $3.75 via Falmouth.

WILLIAM ORTON, President.

ANNUAL MEETING TELEGRAPHERS' MUTUAL LIFE INSURANCE ASSOCIATION.

NEW YORK, November 3, 1871.

At the hour appointed, a goodly number made their appearance at the fourth annual meeting of the Telegraphers' Mutual Life Insurance Association, held in the office of the Metropolitan Superintendent, 145 Broadway, New York. J. D. Reid was appointed chairman, and made a brief address, congratulating the Association on what it had accomplished. He then read the following report:

TREASURER'S REPORT.

Since your last annual meeting the nominal membership of the Association has increased from 1,000 to 1,256. It is safe to say, however, that from deaths, removals, and from various causes, the actual number of members is about 800. Thus, for example, of the 125 first applications in the city of New York, under which the Association began its work, six have died, and 36 have been dropped from the record. This is, perhaps, a result to be expected, and yet it seems likely that the membership will soon be composed of 1,000 intelligent, reliable members, who will regularly and promptly remit their assessments. This will be a very satisfactory result.

So far the deaths have shown a low average, in no year, except the first, averaging over one per cent. upon the membership. During the last year seven members have died.

R. W. O'Brien, Minneapolis, Minn., Nov. 4, 1870.
George M. Harrison, Albany, N. Y., Dec. 22, 1870.
D. W. Warner, Cincinnati, O., Jan. 16, 1871.
Josiah A. Cure, New York, Feb. 12, 1871.
J. C. Christie, New York, June 8, 1871.
R. H. Marriott, New York, July 27, 1871.
William H. Hill, New York, Oct. 16, 1871.

The four last named were on the original roll of the Association, the last, Mr. Hill, having been, from the organization, a member of the Executive Committee.

Although the dead are, properly, the objects of our brotherly memory and affection, yet, in the decease of our departed associate Mr. Hill, we naturally feel the bursting of a nearer and stronger tie. He was well known to all present, and was, on account of the excellence of his character, one of the first names presented as one of the future guides of the Association. To me, as to you, he was always an object of great personal regard. He had a quiet, discriminating, intelligent, and sound judgment, as well as a gentle and kind and warm heart. His departure makes a vacancy which, even when you shall have filled it with a new occupant, we shall long feel.

The condition of the funds of the Association is as follows:

Balance on hand for expenses,............	$340 38
Cash on hand for Hill heirs,..................	746 50
Advance payments on future assessments,....	129 00
	$1,215 88

This sum is all carefully deposited in responsible hands. Eight-one dollars has accumulated from delinquents returning, after settlement with heirs has been made, as authorized by a rule of the Association, which orders the Treasurer to close his account with heirs 60 days after the date of an assessment, all future payments on that assessment being forfeited to the benefit of the expense fund of the Association. This requires confirmation by this annual meeting.

It occurs to me to suggest that a small pass-book be provided to the members, and to each applicant in which may be recorded remittances, when made' number of the P. O. order, &c., and, also, have the rules of the Association printed therein. To many this would be a great convenience.

It seems necessary to say that, in advising persons to become members of the Association, it should be distinctly impressed upon them the probabilities of annual assessments. These should not be rated as less than one per cent. Thus, with a membership of 800, 8 assessments should be calculated upon. Last year there were only 7, but ordinary mortality averages more. Those who do not feel equal to such a call should not join, or be induced to join, unless they desire, through this channel, so long as they can, to contribute to the aid of the families who are left, from time to time, destitute by the decease of those who have been their providers.

Quite a number of members have, within the year, remitted for several advance assessments, a few even having paid up to No. 30. This saves much labor and places a fund ready for prompt use, and the provision for each assessment is acknowledged as soon as it is issued.

It will be seen that New York city has been largely benefited by the Association, a large number of the deaths having occurred here, the four last from our very side. All were healthy when they joined. The general disease, causing death, has been consumption. I cannot here undertake to trace out the causes of this mortality. It seems as if death would have come to all of them with equal rapidity in any other calling.

I beg to congratulate you upon your good work, and the interested presence of so many here, to-day, and trust that your ranks may remain unbroken until we meet again, after the passage of another year.

JAMES D. REID.

The election of officers for the ensuing year being called for, the following persons were unanimously elected:

James D. Reid, Treasurer.
W. K. Applebaugh, Secretary.

DIRECTORS.

A. S. Brown, W. K. Applebaugh,
Gerritt Smith, James D. Reid,
D. R. Downer.

◆

OBITUARY RESOLUTIONS.

On motion of David R. Downer—

Resolved, That, as members of the Telegraphers' Mutual Life Insurance Association, we hereby desire to express our unfeigned sorrow and our sympathy with those who must sorrow deeper than we can, on account of the decease of our late brother and friend, William H. Hill, a member of our Executive Committee.

Connected for a score of years with the telegraph, first as messenger, and for years past as the manager of the delivery department of the Central office of the W. Union Telegraph Co., a post involving great and constant attention, sagacity, patience and care, he has always been found true to his trust, and faithful to all his friendships. To us he was endeared by all that makes a friend desirable; cheerful, even when struggling with his increasing illness; kind and considerate, intelligent, and true in all things. His departure, therefore, is deeply and widely felt, and his memory must long be affectionately cherished.

Resolved, That as an officer of the Association convened this day, and to the duties of which he has devoted himself during the past four years, Mr. Hill entitled himself to our gratitude and esteem by the fidelity and judgment he has always shown in connection with its duties. His absence to-day shows how near the work of the Association comes to us all. We believe that it must be a source of satisfaction to us all to know that, by our organization, we are enabled to provide so much for the little orphan children, who must now seek other hands to lead them up to life's work and conflict.

TELEGRAPHERS' MUTUAL LIFE INSURANCE.

ASSESSMENT NO. 23.

13	40	43	52	56	61	69	82	83	111	122
129	134	141	142	144	150	162	172	176	177	185
186	187	201	202	217	220	228	230	240	242	244
254	257	259	262	263	264	265	266	267	270	278
279	280	281	282	283	285	289	340	378	398	406
412	414	416	425	426	430	431	433	438	451	453
455	457	461	476	510	515	520	533	546	547	548
554	564	566	577	586	594	602	632	646	660	666
672	678	679	680	685	695	697	700	702	730	731
736	769	775	798	799	800	815	817	831	842	912
914	915	942	945	978	995	1000	1038	1053	1055	1062
1081	1091	1093	1126	1132	1133	1142	1144	1145	1146	1149
1163	1172	1212	1215	1216	1219	1223	1231	1233	1241	

ASSESSMENT NO. 23—CONTINUED.

2	5	8	34	40	49	53	77	86	91	104
105	136	139	146	148	154	156	157	158	160	164
178	179	180	182	189	190	191	192	193	197	198
200	206	213	218	230	235	243	244	255	256	273
288	294	297	315	316	319	323	327	328	330	332
342	346	347	364	372	376	379	388	392	393	394
405	417	428	435	437	462	478	482	485	495	496
497	500	503	504	506	507	508	531	536	545	569
574	579	584	590	595	597	604	616	617	618	632
650	656	659	662	663	664	665	669	690	692	698
704	711	720	723	724	726	738	743	744	758	762
763	766	772	773	774	777	778	780	789	791	814
823	825	844	856	868	873	875	876	880	886	897
904	930	931	938	942	952	954	955	956	957	958
959	960	963	964	976	977	996	1002	1005	1009	1011
1025	1028	1039	1042	1043	1073	1074	1075	1076	1077	1080
1094	1099	1102	1103	1134	1135	1139	1143	1148	1150	1151
1164	1173	1174	1180	1181	1182	1183	1189	1191	1192	1193
1194	1195	1200	1201	1202	1203	1206	1209	1210	1213	1214
1217	1218	1222	1228	1229	1233	1234	1235	1236	1238	1242
1243	1244	1247	1248							

ASSESSMENT NO. 24—CAUSED BY DEATH OF CHRISTOPHER REYNOLDS.

2	23	28	34	44	64	77	140	163	177	186
271	286	311	323	332	341	363	371	380	411	450
463	464	509	526	547	552	553	560	564	565	618
626	649	660	710	716	741	838	859	874	910	917
922	932	934	1001	1006	1014	1016	1019	1026	1046	1066
1103	1106	1146	1178	1233	1251	1252	1254	1262		

◆

THE TILLOTSON GIFT TO THE CHICAGO WORKMEN.

The employés of the establishment of S. G. Tillotson & Co., in conjunction with the firm, have made up a purse of three hundred dollars as a donation to their fellow workmen at Chicago (employés of Bliss, Tillotson & Co.), whose houses were burned by the late fire. The following are the names of the men who participated in the good work:

E. M. Pierson,
Wm. Markland,
Sanford Redman,
C. F. Hild,
John Kilroy,
Charles Able,
John Mangin,
Louis Derrick,
Martin Hager,
F. Munhardt,
S. Schneckert,
Oscar Bower,
Smith Redman,
Robert Amner,
Edward Schwerett,
Charles Schwardt,
Joseph Mayer,
Michael Burke,
John Hoey,
John Burke,
F. Kabler,
Geo. Minster,
John Law,
Albert Leach,
Henry Splitdorf,
Theo. Wilke,
Charles Freeman,
Theo. Ehrhardt,
Wm. Bayer,
Joseph Cannon,
M. Deinlein,
A. Huam,
W. Hartman,
W. H. Geroin,
David Norris,
John Harrington,
John Fuchin.

◆

BORN.

October 27, to George W. Flagg, manager W. U. office, Newport, R. I., a boy. Weight, thirteen pounds.

A SUPERIOR

Printing Telegraph Instrument,

FOR PRIVATE AND SHORT LINES.

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PRINTING TELEGRAPH INSTRUMENTS

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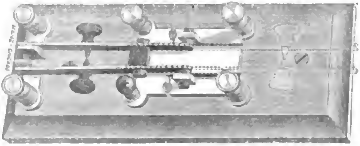
SYRINGES, FUNNELS, HYDROMETERS,
ACIDS AND CHEMICALS FOR BATTERIES,
KERITE WIRE,
BRAIDED AND WOUND OFFICE WIRE,
GUTTA PERCHA OFFICE WIRE,
SWITCH CORD,
CALLAUD BATTERY,
DANIELL BATTERY,
GROVE BATTERY,
BUNSEN BATTERY,
LECLANCHE BATTERY,
HILL BATTERY,



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CUT-OUTS, (new style),
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NORMAN C. MILLER, Sec. and Treas. EDWARD A. CALAHAN, Sup't.

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(Patent applied for.)

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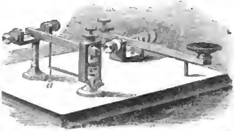
PATENTED MAY 31st, 1870.



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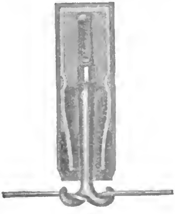

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